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Charles V. Chapin, M. D.

Relative Values in Public Health Work
Franz Schneider, Jr.

The Efficiency of Venereal Clinics
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Industrial Hygiene and Health Insurance
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SIXTY YEARS OF THE PROVIDENCE HEALTH DEPARTMENT

CHARLES V. CHAPIN, M. D.,
Superintendent of Health, Providence, R. I.

Read before the Massachusetts Association of Boards of Health, Providence, R. I., July 27, 1916.

THE Health Department of Providence was formally organized on July 7, 1856, by the appointment of Dr. Edwin M. Snow as Superintendent of Health and City Registrar. Doctor Snow remained in office until succeeded by the writer.

It is true that Doctor Snow was appointed City Registrar on July 23, 1856, and also "medical adviser" to the Board of Health (Mayor and Board of Aldermen), but it was not until the May session of the Legislature in 1856 that the city was authorized by law to appoint a health officer and determine his duties and it was under this act that the appointment was made on July 7 and rules adopted.

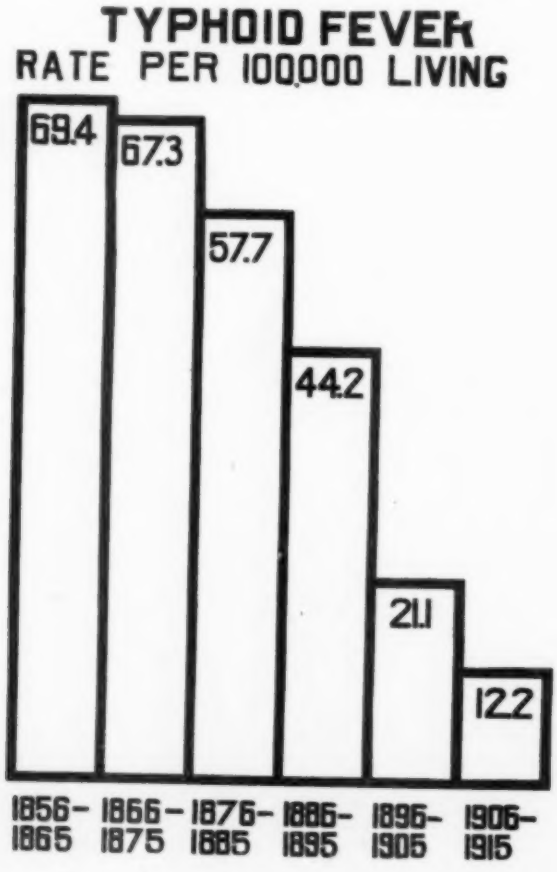
The immediate cause of the organization of the department was an outbreak of cholera which occurred in 1854 and which was investigated by Doctor Snow who made a report thereon to the Providence Medical Association and which was transmitted by it to the Mayor. There had been an outbreak of cholera in 1832 and in 1849. The permanent organization of the department was the result of these epidemics.

Doctor Snow presented his first annual report in July, 1857, and though he remained in office until 1884 never presented another, for, he said, there was little use in doing so until the recommendations in the first report had been carried out. Among the important measures recommended by Doctor Snow were a municipal water supply, a system of sewers, the ultimate treatment of the sewage and disposal at Field's Point, the removal of privy vaults and an adequate housing law. City water was not introduced until 1871. Sewers were begun a few years later, the sewage works were constructed in 1901 and the general order for the abolition of privies was passed in 1892. The housing question is now (1916) still being actively discussed.

It may not be amiss at this time to inquire what changes have taken place in the prevalence of disease

during the past sixty years and in what measure these are probably due to efforts made directly for their control.

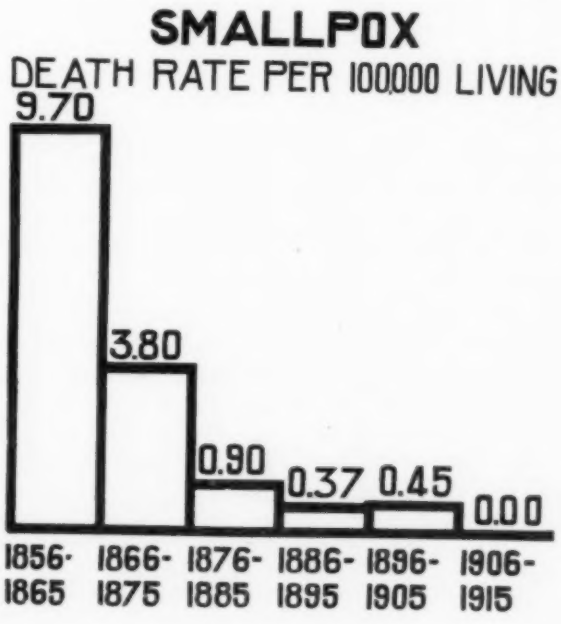
The earliest efforts were made for the restriction of the diseases spread by human excrement, namely cholera, typhoid fever, diarrhea and dysentery. Progress in sewer construction, house drainage, water supply and other things promoting cleanliness was slow in Providence, but the improvements have finally been made. Cholera only appeared once after the health department was organized, in 1866, and the mortality was less than one-tenth what it was in 1854. The reduction in the mortality from typhoid fever and diarrheal and dysenteric diseases is shown by the accompanying diagrams. Perhaps the improvement is more clearly brought out by the statement that if the earlier rates had prevailed there would have been in 1915 about 175 deaths from typhoid fever instead of 21. Moreover of the 21 deaths in 1915, 6 were of non-residents dying in our hospitals and this means of swelling the death-rate did not

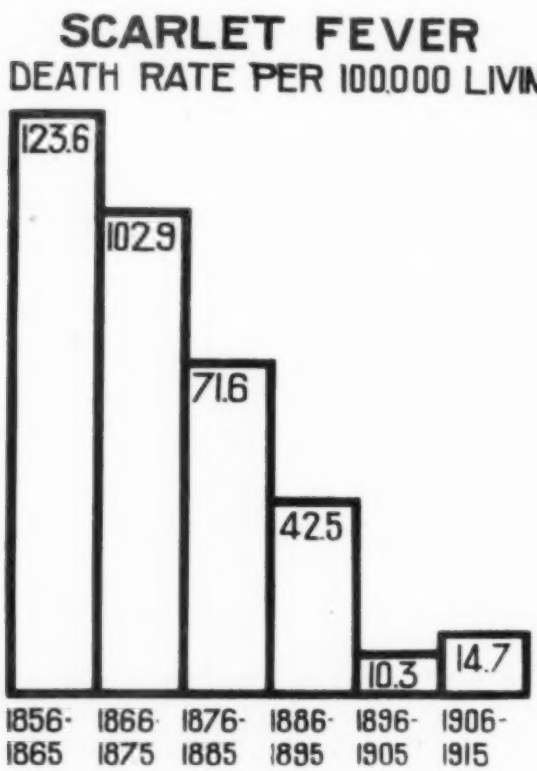


exist sixty years ago. If the diarrheal rate of the first decade had persisted there would have been 630 deaths in 1915 instead of 175.

The characteristics of the second period of public health activity were the control of the directly contagious diseases by isolation, disinfection, vaccination and the like. The disease against which these measures were first energetically carried out was smallpox. The results are well shown in the diagram. This diagram must not, however, be compared with the other diagrams as it is drawn on a scale eight times larger than the scarlet fever diagram. There have been no deaths from this disease and only 39 cases in fifteen years;

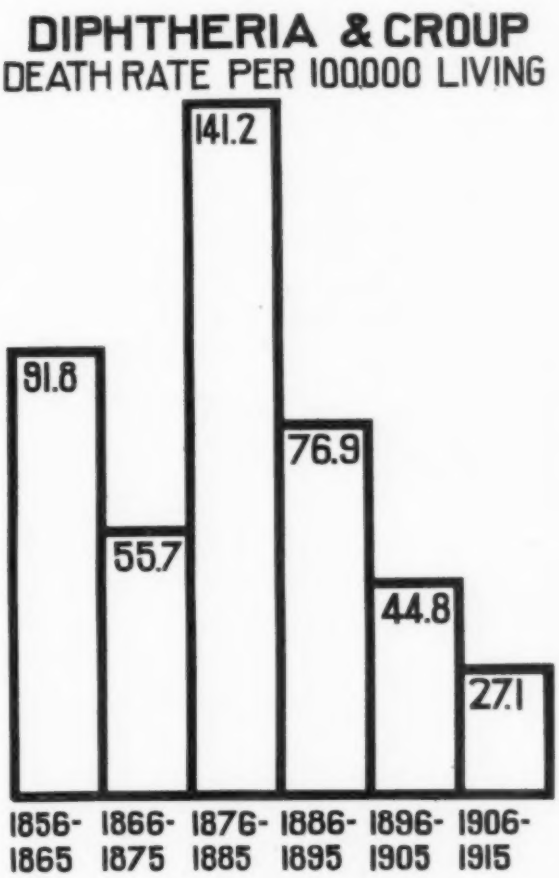
Scarlet fever has shown a greater decrease than any other of the contagious diseases except smallpox. A part of this decrease is due to the fact that there is much less of the severe type of the disease than formerly. There is reason to believe that sixty years ago scarlet fever was usually a severe and dangerous disease. The tradition of those days causes it to be dreaded more than some diseases of greater danger. Outbreaks of the former fatal type do occur now but they are less frequent and shorter than formerly. It was freedom from such an outbreak during the decade 1896–1905 that gave the exceptional small number of deaths in those years. An outbreak of the severe type lasting about six months in the winter of 1906–7 was the cause of the higher mortality in that decade. There is reason to believe that isolation has not only reduced the prevalence of the disease but I feel very certain that it





has also decreased its severity. It is highly probable that the same thing has taken place in smallpox. In both diseases the severe cases are easily recognized, and now-a-days are pretty certain to be well isolated. In this way the severe type has little chance to spread. The mild cases, on the other hand, often escape discovery and go about spreading the disease. Modern methods of isolation in scarlet fever and smallpox should be credited both with decreasing the number of cases and also with reducing the severity of the disease.

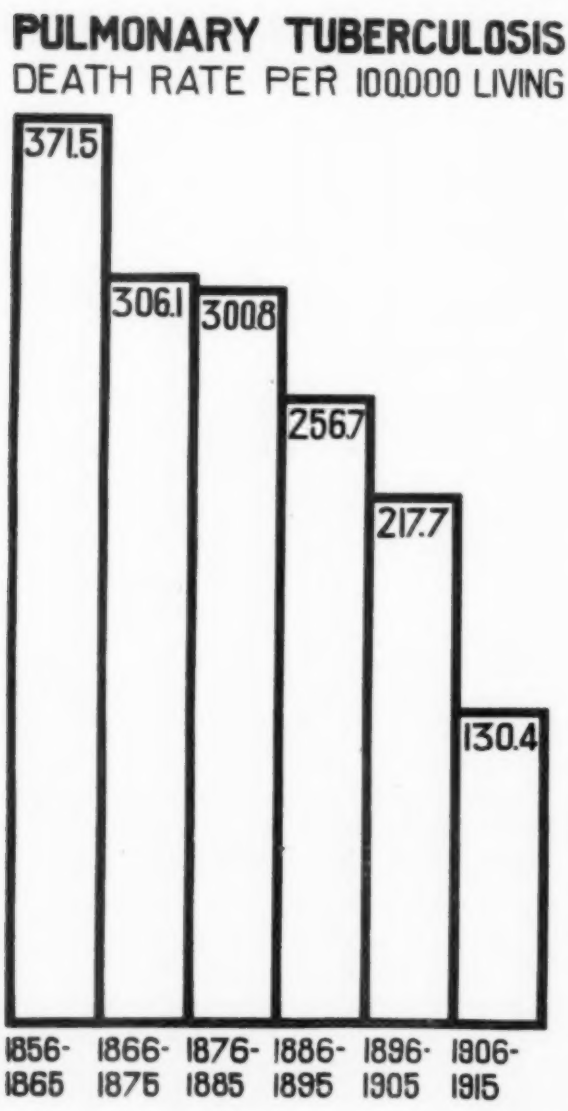
In former years a great deal of diphtheria was reported as croup so that the death-rates from these two diseases have been combined in the diagram. Diphtheria increased in Providence rapidly until 1877. It seems likely that a new and severe strain of the disease was introduced from Europe in 1858. The contagious nature was not fully recognized, at first, and, as late as the great outbreak in 1877, it was believed by many to arise *de novo* in filth. It was not until after this that isolation began to be generally practised. While isolation has probably tended to decrease the prevalence of the disease the most important factor in reducing the death-rate has undoubtedly been the use of antitoxin and the intubation of the laryngeal cases. A great majority



of the cases requiring this procedure are now sent to the City Hospital. The diagram illustrates in a graphic manner the improvement which has taken place.

The third phase of public health activity, the education and direction of the individual, often accompanied by medical treatment, has only received general attention during the present century. The principal lines of activity so far have been the control of tuberculosis, the prevention of infant mortality and the supervision of school children. The results of the latter cannot as yet be shown statistically.

The decrease in pulmonary tuberculosis has been most remarkable. This disease though contagious, is so chronic that it cannot be controlled by ordinary methods of isolation, yet it is far less prevalent than formerly. It is almost certain that this decrease has not been due to any one thing but is dependent upon a variety of causes. Tuberculosis is especially a disease of poverty. It is not unlikely that a large part of the decrease has been due

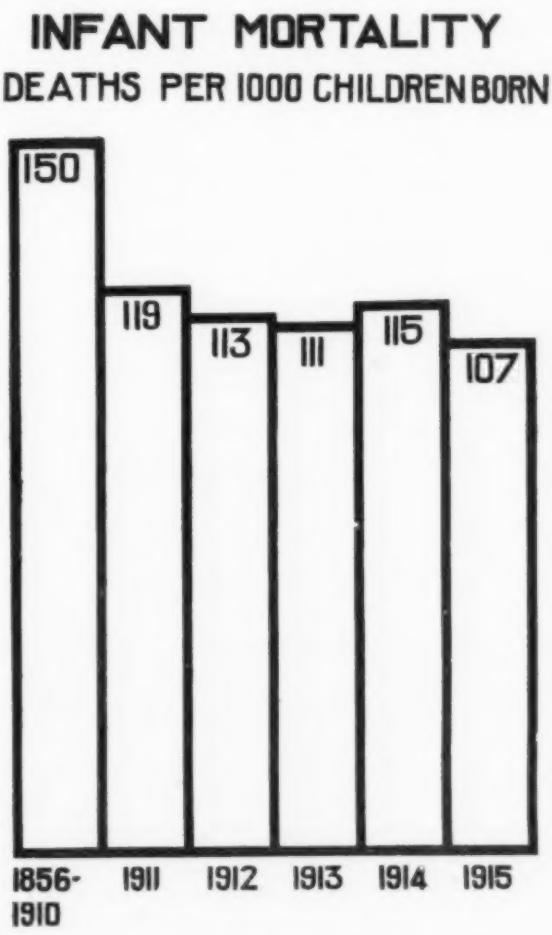


to the great improvement in the material well-being of the people dependent on the scientific discoveries and remarkable industrial development of the last half of the nineteenth century. Those most competent to judge consider that modern restrictive measures deserve a large share of the credit. These are the sanatorium, the hospital, the preventorium, the dispensary and, last but not least, the nurse. It is doubtless due to the influence of these agencies that the tuberculosis death-rate after having declined from 378

in 1856–65 to 143 in 1906–10 declined to 118 in 1911–15.

The infantile death-rate in Providence probably did not vary very much for fifty years. The apparent increase in the last years of the nineteenth century was probably due to less complete registration of births at that period. It was not until the last five or six years that the nurses, the welfare stations, the clinics, the supervision of boarding houses and other agencies of the kind began to make themselves felt. These efforts directed to the individual child, have, in Providence, as elsewhere, caused an immediate decrease in the number of infant deaths as is indicated by the accompanying diagram in which the recent improvement is shown by giving the last five years separately.

As was suggested in the preceding



paragraphs, a decided change has taken place within the last few years in the methods and purposes of public health work. In fact there have been three stages in the evolution of modern preventive medicine.

In the first period attention was given almost exclusively to the environment and almost not at all to the individual. This was the period toward the middle of the nineteenth century when typhoid fever, dysentery and diarrhea were the prevailing diseases and epidemic after epidemic of cholera overspread the world. There was no sewerage and human filth abounded. There were few public water supplies and these were polluted. Wells were infected. Water in towns was scarce and personal cleanliness impossible for the poor. The first effort was toward municipal cleanliness. Pure water was demanded. Sewers were built. The filth borne diseases above mentioned have been banished from most of our cities or reduced to a minimum. Unfortunately the success of these measures appealed to many reformers who unthinkingly assumed that, if a little cleanliness cut down a few diseases, it would be possible by making our cities into spotless towns, to exterminate all infection. The untrained health officer, and few were trained in those days, accepted the suggestion, and became little more than a chaser of bad smells. To abate some nuisances and to remove some kinds of filth does save lives but with few exceptions dirt and odors have no relation to disease. The folly of making municipal house cleaning the chief work of the health department was referred to in my report for 1884 where it was urged that more attention be given to the control of diseases which spread by contact from person to person. The modern, scientific, viewpoint is well illustrated by McNutt's authoritative Manual for Health Officers which, of 633 pages, devotes 36 to nuisances including the removal of wastes and fly and mosquito suppression. We have learned that it is infinitely more important to remove adenoids from the backward child than it is to remove ashes from the back yard, to fill decayed teeth than it is to fill sunken lots, to discover incipient tuberculosis in a wage-earner than it is to discover a pin hole opening in the plumbing.

In the second stage of public sanitation attention was given to those diseases due, not to filth, but to contagion by contact. Smallpox, scarlet fever, diphtheria and typhus fever were most dreaded. The isolation of the sick was the chief weapon, except for smallpox, in which disease the first place must be given to vaccination. During the last quarter of the last century health officers gave most of their attention to building isolation hospitals, or securing isolation in the home. Typhus fever is now a rare disease and the deaths from smallpox, diphtheria and scarlet fever are scarcely one-tenth as numerous as thirty or forty years ago. Smallpox might easily have been exterminated, here, as in Germany, if it were not for the strange opposition to vaccination. Doubtless much can still be done to improve isolation, but to get rid of the

remainder of these diseases new methods must be devised.

With the beginning of the twentieth century came a broader outlook in preventive medicine and a different viewpoint, but old methods are not discredited. We must maintain our sewers, protect our water supplies and isolate our sick, or the old conditions will return. In addition, it is seen that the efforts of the health officer must be largely personal. Attention is no longer focused on the small circle of contagious diseases that have been mentioned. It is realized that it is just as important to save a life from tuberculosis as it is from smallpox. A baby saved from improper feeding is just as much an asset as if it was saved from diphtheria. Many forms of disability are a greater burden on the community than is sickness and death. To prevent a child from becoming deaf, or blind, or crippled is as useful as to prevent it from having scarlet fever.

The education of the individual has become a most important duty. The consumptive must be taught such habits of life that he may have a fighting chance. He and his family must be taught the modes of infection and how to combat them. The mother must be instructed how to feed her baby. Parents must be taught that the earache due to adenoids may result in permanent deafness. The tuberculosis nurse, the baby nurse and the school nurse are becoming most important means for carrying on this personal work. Much of the campaign carried on by the health department encroaches on what has been considered the domain of the practising physician, as the advice to the mother on the care of infants, the directions to the consumptive, vaccination, the injection of antitoxin and other sera, the examination of the eyes of school children, the establishment of clinics for tuberculosis and the treatment of syphilis. But these are the things that count. The death-rate from tuberculosis is falling, the fatality of diphtheria is now eight per cent. where it was formerly forty, 200 babies' lives are saved every year in Providence, in hundreds of school children the eyesight has been improved, deafness warded off, tuberculosis detected, crippling prevented, teeth cared for, and the feeble and poorly nourished made strong. Much less is now being done than should be. The death-rate for babies is higher than in New York and Boston. Scores of poor consumptives are still left to die in crowded tenements. The poor who are sick from other diseases in their homes have little medical care. The proper medical care of the sick poor in their homes has hitherto received little attention in this country. Most of our cities are fairly well supplied with hospitals, though the demand for more ward space is constantly increasing. Usually dispensaries for outpatients are fairly ample and are sometimes abused, but nothing is done for the poor patient unable to go to the dispensary but who might be as well, if not better, cared for at home than in the hospital. This is particularly important in the case of babies and children. The very best medical treatment is needed in the home. For

the poor this should be furnished by the city. This was begun in Providence in a small way and must grow.

If the city of Providence intends to hold a place among the most progressive American cities in effective lines of health work it must provide for carrying on such activities as are here suggested. Health work today is very different from what it was sixty years ago. Its sphere will constantly widen in the future. It is for the citizens to decide whether use will be made of modern methods of improving the public health, or whether babies and children will sicken and die, and young men and young women in the prime of life will work with impaired vigor because the municipality fails to do all it can to help them to live right. Among the needs of Providence are:

1. An enlarged service for the protection of baby life. Our death-rate is still higher than in some of the largest cities. The health department needs several more nurses. The welfare stations under private agencies are doing good work. So are the clinics for sick babies. We need others. The maintenance of these may have to be undertaken by the city. The clinics and welfare stations may be expected to develop into permanent local "health centers" under the health department as in New York, Buffalo, Cleveland and other places.

It is earnestly hoped that prenatal work may be organized here as has been so successfully done elsewhere.

2. The milk supply should be improved. There should be a bacterial standard. All milk should be pasteurized unless from tuberculin tested cows. Pasteurization should be closely supervised. Only bottled milk should be sold in stores.

3. The medical inspection of school children and particularly the work of the nurses should be extended. All authorities are agreed that there should be one nurse for each 2,000 school children. This would mean sixteen nurses. At present there are nine. There should be eight school physicians. At present there are four.

4. To supplement the work of the dental inspector dental dispensaries for children are needed. Decayed, aching and defective teeth interfere with school work. The best medical authorities now believe that many disorders and much poor health are due to infection received through decayed and diseased teeth. To preserve the teeth is not only a dental problem, it is a health problem. It can only be solved by organized effort. Many American cities maintain dental clinics. Providence should do so. It would be best to begin with the children in the 1B and 1A grades. Probably four clinics every morning in the week would suffice for this.

5. The medical service for the care of the sick poor in their homes begun by this department should be maintained and enlarged. Five thousand dollars is needed next year. The various charitable organizations have come to depend on these physicians to supplement their work.

6. Most health departments are now employing nurses to visit cases of contagious disease, sometimes to nurse and always to show how to iso-

late and disinfect. Providence was the first city to abandon the practice of fumigation, an example which has now been followed by New York, Boston and other cities. Providence, however, was not the first city to employ a nurse to teach *real disinfection* all through the disease. We have one nurse now and need another, or perhaps two more.

7. The chief means for the direct control of tuberculosis have already been touched upon. The state has a sanatorium which at present seems to be sufficient for the incipient cases for which it was designed. The city maintains a ward for advanced cases at this hospital, as does St. Joseph's hospital, and the state is now building one at Wallum Lake. Doubtless the latter when completed will soon be filled and the city will have to build another ward at this hospital. The several dispensaries are, perhaps, for the time, sufficient to meet the needs, but one or two more will in time be necessary. It is especially important that the one recently established by the City Hospital at the Delaine Street Nursery be continued and probably correlated with a general medical dispensary. The visiting nurse is perhaps the chief factor in prevention and four have been employed by the District Nursing Association. These are not enough and very likely three or four more are needed. If the Nursing Association is unable to finance these the city will have to, or else Providence will be obliged to take a very subordinate position in the nation-wide efforts which are being made to control this disease. Among other useful agencies are the preventorium maintained by the Providence League for the Suppression of Tuberculosis and the open air schools conducted by the city.

It will doubtless be objected that all this is socialism. So it is, and so is our system of public education, and our city water supply and our municipal pier and garbage collection and the proposed removal of ashes. It will also be objected that to carry out the plans proposed costs money and so it does. The health department of New York has as its motto "Public Health is Purchasable." It is the business of the health department to show how it can be purchased. It is for the citizens to determine whether they wish to purchase it.

RELATIVE VALUES IN PUBLIC HEALTH WORK.

FRANZ SCHNEIDER, JR.,
Department of Surveys and Exhibits, Russell Sage Foundation, New York City.

Read before the Massachusetts Association of Boards of Health, Providence, R. I., July 27, 1916.

ABOUT 1,400,000 persons die in continental United States each year. Probably a fourth or a third of these die from preventable causes. In addition, it is asserted, and recent sickness surveys seem to support the claim, that two or three per cent. of our population are, at any one time, disabled through sickness. Then there is the larger number of persons afflicted with illnesses not serious enough to disable but which cause loss of comfort and efficiency.

The task of preventing these vast amounts of sickness and death, so far as is possible, is delegated by the public to its health authorities. The latter must decide what parts of the losses are preventable, and must determine how the greatest return in prevention can be obtained with the money available. This is the problem of relative values in public health work.

If unlimited funds were at the disposal of health departments the problem of relative values would be one of merely theoretical interest. The administrator would need only to institute all the activities that seemed likely to exert a beneficial effect, and at the close of the year prepare a table of expenditures with regard to the several activities. This list would indicate the relative value attached to different activities when no stone is left unturned, but would be a tabulation of purely academic interest.

Quite different is the situation actually confronting health officials. With the scanty funds now at their disposal, and the great variation in effectiveness of different activities, the most careful discrimination must be exercised in making up the department's program. A bad distribution of funds means lives lost, and the responsibility, a heavy one, falls on the administrative official. The problem is rendered the more difficult by the lack of accurate data as to costs and results. The practical importance of an accurate appreciation of relative values can hardly be overemphasized. Professor Whipple, in discussing the subject says, "This is one of the greatest questions that a sanitarian can consider. It is today the most important of all hygienic problems because it comprehends all others."*

THE FIELD OF PREVENTION.

In attempting to determine values it seems reasonable to take vital statistics as the point of departure. Our death and sickness records suggest the opportunities that lie before us, and it is by these figures that we must judge the efficacy of our endeavors. Our

* Whipple, G. C.: "How to Determine Relative Values in Sanitation"; American City, X, 5, p. 427.

TABLE 1.

PREVENTABLE DEATHS IN ALL REGISTRATION CITIES, 1913.

Cause of death.	Number of deaths.		Per cent. of preventable deaths.
Infectious Diseases		149,600	99.0
Tuberculosis—all forms:		56,624	37.5
Lungs	48,733		
Meningitis	3,861		
Other forms	4,030		
Diarrhea and enteritis (under 2)		30,244	20.0
Bronchopneumonia		21,091	14.0
Common contagious diseases		19,058	12.6
Measles	4,517		
Scarlet fever	3,854		
Whooping-cough	3,047		
Diphtheria and croup	7,640		
Typhoid fever		5,627	3.7
Syphilis—total		4,902	3.2
Syphilis	3,422		
Locomotor ataxia	1,020		
Softening of the brain	460		
Influenza		3,000	2.0
Puerperal fever		2,825	1.9
Gonococcus infection		191	0.1
Other infectious diseases		6,038	4.0
Erysipelas	1,599		
Dysentery	1,212		
Tetanus	876		
Cerebrospinal fever	834		
Malaria	644		
Infantile paralysis	392		
Cholera nostras	140		
"Other epidemic diseases"	124		
Rabies	67		
Smallpox	44		
Intestinal parasites	30		
Mycoses	24		
Hyatid tumor of liver	13		
Anthrax	12		
Ankylostomiasis	10		
Glanders	7		
Leprosy	4		
Typhus fever	3		
Relapsing fever	2		
Plague	1		
Nutritional Diseases		1,097	0.7
Pellagra	702		
Rickets	335		
Scurvy	53		
Beriberi	7		
Poisoning by Food		329	0.2
Industrial Poisonings		124	0.1
Lead poisoning	120		
Other chronic occupational poisonings	4		
Total—preventable deaths	151,150		100.00

sickness records are, unfortunately, so fragmentary as to be of little practical value, while our death records are reliable for only two thirds of the country. Let us turn, however, to the mortality statistics for 1913, and seek to discover the opportunities for prevention.

The registration cities of the country represented in 1913 a population of 34,230,283, or 35 per cent. of the total. In Table 1 an attempt is made to show the preventable deaths occurring in these cities. This table is intended to include all infectious diseases; certain nutritional diseases, such as beriberi and pellagra; industrial poisonings; and food poisonings. Certain of the infectious diseases included, such as puerperal fever, will seem novel in connection with health department activities. They are included on the theory that being infectious, they are preventable; that ultimately we may come to prevent them; and that the health department is the only governmental agency whose business it is to prevent them. The numbers of deaths from these diseases are, furthermore, relatively small.

There are conspicuous omissions from the list. Cancer is a strik'ng example. No one doubts that many deaths from cancer may be avoided through early operation, and allowance must be made for this disease in making up relative values; however, it has seemed better to omit cancer from this list, and to lump it in with the degenerative diseases of middle age. Allowance will be made for this group of diseases under the heading of health education. Again, the list disregards the great group Diseases of Early Infancy, from which something certainly can be saved. In addition, bronchopneumonia is included entire and placed in the infant group, while all other forms of pneumonia are omitted. Finally, the list seriously understates the losses caused by the venereal diseases, making no effort to include the deaths that may be due to syphilis but that are registered under diseases of the arteries and other organs, although it does include deaths from locomotor ataxia and softening of the brain. The list also disregards deaths from such causes as salpingitis—deaths in which gonorrhea may play a part. An attempt to make due allowance for these inclusions and omissions will be made later in the paper.

It is worthy of note that this list of preventable deaths, although conservative, totals 151,150, or 29 per cent. of the deaths from all causes.

Damage Done as a Criterion.

When we come to compare the different diseases in the list it becomes evident that relative importance cannot be tested adequately by any single criterion, but that several of fairly equal importance must be considered. One of the most obvious tests is the number of deaths caused by each disease. On this basis tuberculosis, responsible for 56,624, or 37.5 per cent. of the whole preventable list, is the most important. Second in importance comes diarrhea and enteritis among children under two, responsible for 30,244, or 20.0 per cent. Next comes bronchopneumonia, with

14.0 per cent.; followed closely by the four common contagious diseases of children—diphtheria, scarlet fever, whooping-cough, and measles, responsible as a group for 12.6 per cent of the deaths.

But the number of deaths is not an adequate measure of the damage done. For one thing, it fails to take account of non-fatal illness. Perhaps the extreme example of this failure is gonorrhea. In the table this disease is represented by only 191 deaths, about 0.1 of one per cent. of the total; yet we know that gonorrhea is one of the commonest of communicable diseases, and that its public health importance is far in excess of the figure just given. Other examples of diseases with low fatality rates, and whose importance is inadequately represented by the death test are hookworm and malaria. In measuring the loss due to any preventable disease we must consider not only the number of deaths but the number of cases of non-fatal sickness, the duration of attack, and the seriousness of secondary effects or impairments. Unfortunately, our knowledge of these things is imperfect.

Another factor comes into the estimate of damage done—the relative value of the lives lost or temporarily disabled. The economic value of an infant is of course not as great as that of a wage-earner. On the other hand, we realize that economic value is an unsatisfactory measure of the value of life, and is one the public is inclined not to accept. Most of us would put the humanitarian side—the anguish caused those near and dear—above economic value; and on this basis the loss of an infant may be as important as that of an older person. The argument that the loss of a wage-earner may have a serious effect on a greater number of persons is one deserving more consideration.

Preventability as a Criterion.

Passing from damage done, we come to another criterion of the first importance—preventability. Certain of our "preventable" diseases are much more preventable than others. Smallpox is, by vaccination, almost absolutely preventable. Typhoid fever is another disease we are prepared to attack with great confidence if the necessary funds and powers are at our disposal. Infantile paralysis, on the other hand, is much more difficult to curb; and measles, with its period of infectivity principally before the appearance of symptoms, is largely independent of our efforts. Similarly, we expect quicker and more sharply defined results from infant hygiene work than from that directed against tuberculosis.

Attention must be given not only to the general preventability of the disease, but to the degree of prevalence. It is generally easier to secure results in a virgin field. After a death-rate has been forced down to a certain level, each new unit of reduction is successively more difficult. This is the problem of residuals, and must be considered with reference to local conditions.

Cost of Prevention as a Criterion.

A third major criterion is cost of prevention. The great importance of this factor is enforced by the meagre-

ness of the funds at our disposal. In some respects cost is the most important criterion of all. It can be argued that in considering activities we should determine what line of effort will save a unit of life or health for the least money, and then prosecute that activity alone until the law of diminishing return brings the activity to a par with its nearest rival.

Such a one-sided program is of course impracticable. Even if theoretically desirable, which is questionable, such a course would not be tolerated by public opinion. Great weight must, however, be given to the factor of cost. The figure used should include only that to the health department, and not that to society as a whole. Otherwise we shall become entangled in questions of other standards of value, such as comfort, convenience, and aesthetics; and these seem to be matters to be interpreted by the demographer, and evaluated by the people themselves.

Communicability as a Criterion.

Another factor that seems to deserve consideration is the communicability or contagiousness of a disease; in other words, its tendency to become epidemic. On account of this property, certain diseases, such as smallpox, must be suppressed immediately upon appearance, almost without regard to cost and, it may be, quite without regard to the amount of damage they may have done in the community during the last year, or the last ten years. Such diseases, if neglected, may quickly cause extremely abnormal damage. Communicability appears not to be correlated with the other three factors. Infant mortality, for example, which receives high ratings with regard to damage done, preventability, and cost, receives a relatively low rating for communicability. Accordingly this factor seems to qualify as a separate criterion.

Solution for Relative Values.

In general, then, the relative value of a disease, or of an activity to prevent a disease or diseases, would seem to depend on four prime factors: first, amount of damage done; second, preventability; third, cost of prevention; fourth, tendency to become epidemic. As a formula this might be expressed:

Value = Damage × Preventability × Cost × Communicability.

Certainly these seem to be the main criteria. Perhaps weights should be assigned to the four factors, but this is a refinement one hesitates to attempt. It should be noted that in the formula, cost is in the nature of an inverse factor.

One other point deserves attention. Certain activities are indispensable to a health department. For example, nothing is more important than the registration of vital statistics, yet it is obviously difficult to assign any number of deaths prevented by this work. Similarly it is difficult to measure the results of health education, although we feel sure it is an important part of the program. Perhaps activities of this kind should be regarded as in the nature of "overhead" charges. At all events, they should be assigned a liberal value.

Relative Value of Different Causes of Death.

The task of applying these criteria and of deriving a set of values is a difficult one. In offering the following values no claim is made for a high degree of accuracy. It is believed, however, that the values derived permit a considerable margin for difference of opinion without altering the general conclusions which the figures suggest. The method may, moreover, suggest ways in which more accurate values eventually will be derived. The calculations involved appear in Tables 2 and 3.

Starting with the original list of preventable deaths (Table 1), an estimate has been made of the damage done by the different causes. This estimate is intended to give due weight to non-fatal illness, and the other damage factors already mentioned. The proportions of damage done assigned to the diseases are, arranged in order of magnitude, as follows: tuberculosis, 25 per cent.; infants' diseases, 25 per cent.; venereal diseases, 20 per cent.; the four common contagious diseases of children, 15 per cent.; typhoid fever, 5 per cent.; other infectious diseases, 8 per cent.; nutritional diseases, 1 per cent.; and poisoning by food, 1 per cent.

These values have been multiplied by what seem appropriate factors representing preventability, cost of prevention, and tendency to become epidemic, the various steps of the computation appearing in Table 2. The resulting values, which relate to causes of death and not to lines of activity are, when reduced to per cents and arranged in order of magnitude, as follows.

TABLE 2.

CALCULATION OF VALUES FOR DIFFERENT CAUSES OF PREVENTABLE DEATH—AND ADJUSTMENT TO INCLUDE VALUES ARBITRARILY ASSIGNED.[a]

Cause of death.	I. Per cent. of deaths.	II. Estimate of damage done.	III. Factor[b] for preventability.	IV. II times III.	V. Factor for cost.[c]	VI. IV times V.	VII. Per cent.	VIII. Factor for communicability.	IX. VI times VIII.	X. Per cent.	XI. X times 0.73.
Tuberculosis	37.5	25.0	6	150	4	600	14.5	5	3,000	16.9	12.3
Infants' diseases	34.0	25.0	8	200	10	2,000	48.4	3	6,000	33.9	24.7
Diarrhea and enteritis	(20.0)										
Bronchopneumonia	(14.0)										
Contagious diseases of children	12.6	15.0	6	90	6	540	13.1	10	5,400	30.5	22.3
Venereal diseases	3.3	20.0	5	100	4	400	9.7	4	1,600	9.0	6.6
Typhoid fever	3.7	5.0	9	45	8	360	8.7	3	1,080	6.1	4.5
Other infectious diseases	7.9	8.0	5	40	5	200	4.9	3	600	3.4	2.5
Nutritional diseases	0.7	1.0	6	6	5	30	0.7		30	0.2	0.1
Poisoning by food	0.2	1.0	1	1	1	1	0.0		1	0.0	0.0
Industrial poisonings	0.1	[d]	[d]	[d]							
Total	100.0	100.0				4,131	100.0		17,711	100.0	73.0

[a] Based on mortality in all registration cities, 1913.
[b] Factors on a scale of 10; that number being most favorable rating, one being the least favorable.
[c] Cost—to health department.
[d] Disregarded.

Values arbitrarily assigned:

Inspection of school children	7.0
Education	5.0
Vital statistics	5.0
Dispensary and clinics	5.0
Laboratory	5.0
Total	100.0

First: infants' diseases, 33.9 per cent. The two causes included under this heading, diarrhea and enteritis under two and bronchopneumonia, are responsible for 34 per cent. of the deaths in the preventable list. Bronchopneumonia, responsible for 14 per cent., includes deaths of other than infants; but the median age of the deceased is 1.5 years, and 68 per cent. of the deaths occur among children under five. To compensate for the deaths improperly included, there are the deaths of infants from several other causes which I have disregarded, —such causes as pneumonia, and the group Diseases of Early Infancy. Deaths of infants under two amount to over one fifth of all the deaths that occur, and in our list of preventable deaths this group of infants accounts for over a third of the total. In an unworked field, infant mortality offers a high degree of preventability at a low cost; if it were not for a low rating on communicability it would attain even a higher value than it does.

Second: the four contagious diseases of children, 30.5 per cent. These diseases are responsible for 13 per cent. of the preventable deaths, and are estimated to be responsible for 15 per cent. of the damage done. They are the most likely to become epidemic, a fact that contributes largely to their high final rating.

Third: tuberculosis, 16.9 per cent. Although responsible for 37.5 per cent. of the preventable deaths, its value is reduced by high cost of prevention, moderate preventability, and absence of the acute tendency to become epidemic that characterizes some of the other communicable diseases.

The fourth value falls to the venereal diseases, 9 per cent. Although only 3.3 per cent. of the preventable deaths can be definitely ascribed to these diseases it is certain that they cause many deaths that are registered under other titles. In addition, there is a tremendous number of non-fatal cases, and the indirect results of these are frequently grave. Conservative estimates have placed the number of cases in the country at two or three million. This field is almost untouched, and health department effort in the way of education, diagnosis, and treatment, should accomplish great good.

The fifth place goes to typhoid fever, with a value of 6.1 per cent. Then follow other infectious diseases, 3.4 per cent.; and nutritional diseases, 0.2 per cent. Poisoning by food registers less than 0.1 per cent.

These are values calculated for the different causes in our list of preventable deaths. It is necessary now to make allowance for certain diseases, such as cancer and the degenerative diseases of middle age, which were not included in that list; to make allowance for certain activities that are indispensable to a health department; and to express the result in terms of health department organization.

Values According to Lines of Activity.

To health education an arbitrary value of 5 per cent. in the final scale is assigned. This item will cover activities in behalf of the semi-preventable diseases just mentioned. Similarly, a

value of 7 is assigned to the physical examination of school children, and a value of 5 to each of the following activities: vital statistics, dispensary and clinics, and laboratory. As these arbitrarily assigned items aggregate 27 per cent., it is necessary to reduce proportionally the previously determined disease values to make them total 73 per cent. Table 3 exhibits the distribution of what seem appropriate parts of these reduced values among the following activities: milk control, privy and well sanitation, fly and mosquito suppression, and food sanitation. The result is the following list of final values, expressed according to lines of health department activity.

TABLE 3.

DISTRIBUTION OF DISEASE VALUES ACCORDING TO LINES OF HEALTH DEPARTMENT ACTIVITY.

Disease.	Relative value.	Milk control.		Food sanitation.		Privy and well sanitation.		Fly and mosquito suppression.		Tuberculosis.		Infant hygiene.		Control communicable diseases.	
		Fraction.[a]	Value.	Fraction.	Value.	Fraction.	Value.	Fraction.	Value.	Fraction.	Value.	Fraction.	Value.	Fraction.	Value.
Tuberculosis	12 3	02	35							98	12 05				
Infants' diseases	24 8	06	1 49			06	1 49	06	1 49			82	20 34		
Diarrhea and enteritis		(10)				(10)		(10)				(70)			
Bronchopneumonia		[b]		[b]								(10)			
Contagious diseases of children	22 3	02	45											98	21 85
Venereal diseases	6 6	[b]		[b]	[b]										
Typhoid fever	4 5	10	45	01	05	40	1 80	10	45					39	1 76
Other infectious diseases	2 5	02	05	02	05	10	25	20	50					06	1 05
Poisoning by food	0 0			1 00	00										
Total	73 0		2 69		10		3 54		2 44		12 05		20 34		25 26

[a] "Fraction" indicates fractional part of disease value estimated preventable by activity.
[b] Not distributed.

TABLE 4.

Final values* as applied to activities directly concerned with:

Control of Communicable Diseases—	
Tuberculosis	12.1
Venereal diseases	6.6
All others	25.3
Infant hygiene	20.3
Privy and well sanitation	3.5
Milk control	2.7
Fly and mosquito suppression	2.4
Food sanitation	0.1
Inspection of school children	7.0
Vital statistics	5.0
Education	5.0
Dispensary and clinics	5.0
Laboratory	5.0
Total	100.0

* For a more detailed subdivision of values see, Chapin, C. V.: "Effective Lines of Health Work," *The Providence Medical Journal*, January, 1916. Persons interested in relative values should consult also, "How Shall We Spend the Health Appropriation," by the same author, AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. III, No. 3, page 202.

The value 25.3 for communicable diseases other than tuberculosis and the venereal diseases may seem high as compared with the values for those specific diseases and that for infant hygiene. On the other hand, this 25.3 per cent. must cover the work against the common contagions of

children, as well as that against typhoid fever, smallpox, and others of the more unusual diseases. It must take care also of the possibilities in connection with pneumonia. In addition, infant hygiene is represented by 4.5 per cent. in the allowances for milk control, privy and well sanitation, and fly suppression. It is assumed that control of communicable diseases will be carried on with modern epidemiological methods, public health nurses, and emphasis on bedside disinfection of discharges.

The list of final values does not consider industrial hygiene; not because the work is unimportant, but on the theory that state authorities will meet the need. Plumbing inspection does not appear, partly because of lack of evidence to justify its insertion, and partly because this is considered work for the building department. Nuisance abatement is intentionally omitted; it is realized, however, that health departments commonly must carry this largely police function. The privy, well, fly, and mosquito work, for which allowance has been made, cover the important sanitary parts of what is generally understood by nuisance abatement.*

Before leaving these values it seems wise to utter a few words of warning. The values are based on the rates of mortality existing in registration cities as a whole in 1913, and thus represent certain average conditions. Local conditions will of course modify any values, as will the passage of time and the development of sanitary science. Similarly, the importance of different health measures in any one city will be different at different times. It must be confessed that the existing data for the determination of relative values is seriously inadequate. What we need for better values is better vital statistics and better cost-keeping. Probably nothing would be a greater help to the progress of this subject, and perhaps of sanitary science in general, than for our health officers to form the habit of keeping careful records regarding new procedures, together with statements of the results and the costs. These could be published in the departments' annual reports; and thus there would be accumulated a mass of data comparable to that in the handbooks now existing in the fields of civil and mechanical engineering.

Some health officers, of course, do this already; none more admirably than Doctor Chapin of Providence. On this occasion one is tempted to express one's admiration of Doctor Chapin's reports and other writings, and say what models of scientific work they are, and say how much we all owe to him. But one hesitates to do so, from fear that he would dislike it. At all events, when we have more reports like Doctor Chapin's we shall be in a fair way to get our judgments of relative values onto a definite quantitative basis.

Making liberal allowance for inaccuracies in the values here presented,

* For a vigorous exposition of existing inconsistencies see, Armstrong, D. B., "Public Health Values—A Few Modern Fallacies," Proceedings of the Fifth Annual Conference of Mayors of New York State; 25 Washingfon Ave., Albany, 1914. For an excellent critical discussion of the relative value of different branches of his own work by a practising health officer see, Terry C. E., Annual Report of the Board of Health for 1915, Jacksonville, Fla., page 47.

and for possible differences that may be occasioned by local conditions, the following conclusions seem fully justified: The prevention of infant mortality is a fundamental activity, and one of the most valuable a health department can pursue. Very exceptional is the city in which this work can be ignored without convicting the health authorities of gross neglect. Anti-tuberculosis work and that involved in the control of the common contagious diseases, are other activities of prime importance. In addition, it seems time to admit the venereal diseases to the group of larger opportunities. In most cities the value of the above mentioned lines of activity is considerably greater than that of the various forms of sanitary inspection.

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TUBERCULOSIS NURSING—PRESENT AND FUTURE.

"Ten years ago tuberculosis nursing, like every other phase of the tuberculosis movement, was still in the pioneer stage. In the entire country there were approximately four hundred nurses doing tuberculosis visiting work, three hundred and sixty-five of whom were engaged primarily in general visiting nursing, the tuberculosis cases they were handling occupying only a fraction of their time and attention. Some twenty-five or thirty nurses were devoting their entire time to tuberculosis work. Today there are eight hundred and twenty-five nurses doing tuberculosis nursing exclusively, two thousand one hundred and fifteen doing general visiting and tuberculosis nursing, a total of nearly three thousand nurses engaged in caring for tuberculosis cases in their homes," states Miss F. Elisabeth Crowell, Executive Secretary of the New York Association of Tuberculosis Clinics in the August *Journal of Outdoor Life* in an article entitled "Ten Years in Tuberculosis Nursing—A Review and a Forecast."

Since no figures are available for the work done in the country at large, Miss Crowell quotes some New York figures which she believes typical of the expansion throughout the United States. "In 1904–1905 eighteen nurses made 12,504 visits to tuberculosis cases alone. In 1913 one hundred and eighty-seven made 253,842 visits to tuberculosis cases alone. During the last ten years the death-rate from tuberculosis has decreased from 2.18 to 1.60 per 1,000 population."

While the author does not attribute this fall in the tuberculosis death-rate to the activities of such nursing alone, of necessity recognizing other contributory factors, she believes that "not a single one of these factors reached its culminating point of usefulness until the tuberculosis nurse was called to concentrate her efforts upon its practical application to the lives of those who were infected with tuberculosis or were exposed to infection."

In forecasting the future during the next ten years, Miss Crowell laments the fact that now that the tuberculosis machinery has been organized more adequately than ever before, the tendency seems to be to use this machinery for other kinds of work, rather than providing an additional force for the other types of visiting nursing.

"Tuberculosis is still a problem. Child-welfare work is not yet reduced to a rule of thumb. Mental hygiene work is still in its infancy. We have not wiped these problems off the slate after the concentrated effort of several years. Will spreading ourselves out thin over a variety of problems bring us any nearer to their final solution? There is such a thing as over-organization and in its way it is as bad as over-specialization. Administrative procedure has been known to choke itself with red tape. There is no such thing as one-hundred-per-cent. efficiency as long as the personal equation must be considered."

THE HARM DONE IN ASCRIBING ALL BABIES' SORE EYES TO GONORRHŒA.

CAROLYN CONANT VAN BLARCOM,

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Read before the Sociological Section, American Public Health Association, Rochester, N. Y., September 9, 1915.

IN WORK for the prevention of blindness, as in other public health movements, it has been necessary to use certain medical facts as the foundation for widespread public education.

In popularizing medical facts, certain misconceptions will almost inevitably gain currency, some of which are harmless, while others actually defeat the very ends which it is desirable should be attained. One of the most serious of these misconceptions concerning the prevention of blindness in babies is the one that this disease is always, or nearly always, of gonorrhœal origin. In fact, this seems to be the general teaching even in medical circles.

Dr. Ellice M. Alger sums it up as follows: "Both the physician and layman of today consider ophthalmia neonatorum as essentially of venereal origin. All the text-books teach that, for all practical purposes, it is due to an infection of the conjunctiva with the gonococcus. Every case of conjunctival discharge beginning during the puerperal period is at once regarded by physician and mother and friends as a certain proof of an antecedent infection of the mother, received of course through a delinquent husband. All the popular pseudo-scientific teaching, of which we have so much today, lays special stress on this point. Now this is distinctly only about half true and like many other half truths, it has done a tremendous amount of harm. The gonococcus is one of a number of germs which may cause ophthalmia."*

Further on, Doctor Alger says: "The bacteriological diagnosis is of secondary importance, for the treatment is the same no matter what the germ."

We believe that blindness from babies' sore eyes would practically never occur if a prophylactic were used in the eyes of every infant immediately after birth, and if every case of redness, swelling and discharge from the eyes of infants were promptly and adequately treated.

We say to the lay public—babies' sore eyes is an infectious disease; is caused by a germ; if neglected, it may

* *New York State Journal of Medicine*, December, 1911.

result in blindness; the way to prevent this blindness is to adopt a routine use of a prophylactic and secure early treatment for all cases of babies' sore eyes. The public has learned a good deal about disease and infection and the belief has taken deep root that this inflammation of the eyes of infants that we all talk so much about is due to gonorrhœa and gonorrhœa only.

We are convinced that the gonorrhœa theory has been a serious obstacle in the way of universal prophylaxis and early remedial treatment —in some instances because of pride, and in not a few others because of the conviction that there was no venereal infection present.

This theory has been given wide currency, but is it warranted? A study of some of the medical writings would suggest that it is not.

Although organized work for the prevention of blindness is recent, the pathos and horror of infantile blindness has stirred medical men to action almost since the dawn of medicine. Very early there seemed to be a realization that there was something in babies' eyes capable of setting up inflammation and causing blindness and which could or should be removed or destroyed. This may explain why the ancients dropped oil in the eyes of newborn infants.

More than a hundred years ago—in 1807—Benjamin Gibson, an Englishman, made very sound recommendations for the prevention of blindness advising that every child's eyes be washed immediately after birth with "a liquid calculated to remove the offending matter, or to prevent its noxious action."

There are many references of a similar nature to be found in medical literature, but in 1881, Professor Credé, the Leipsic obstetrician, made the most valuable contribution to this subject which had thus far been offered. Briefly, as the members of this audience all know, he advised that every child's eyes should be carefully wiped from the nose outward immediately after birth, and that a drop of a 2 per cent. solution of silver nitrate should be dropped into each eye. As a result of this treatment, Professor Credé reduced the occurrence of babies' sore eyes among the patients in his maternity hospital from about one in every ten cases to one in every four hundred. In addition to this preventive treatment, the infant's eyes were watched for evidence of inflammation—*i. e.* redness, swelling or discharge.

Sydney Stephenson, in his masterly monograph on "Ophthalmia Neonatorum"* has placed in available form more information concerning this disease, its cause and prevention than has been collected thus far by any other person or persons, so far as we are able to learn. His book opens with the observation that: "Ophthalmia neonatorum may be defined as an inflammatory disease of the conjunctiva usually appearing within the first few days of life, and generally due to the action of micro-

* The Middlemore prize essay of the British Medical Association of 1907.

organisms." Later on he says: "Let us first inquire in what proportion of cases of ophthalmia neonatorum the gonococcus has been demonstrated." Then follows a table. Continuing, "The above table shows that in the practice of 41 observers gonococci were found in 67.14 per cent. of the 1,658 cases of ophthalmia neonatorum."

Finally he observes: "It may be stated in round numbers that of every 100 cases of ophthalmia neonatorum, 65 per cent. will be associated with gonococci, 10 per cent. with pneumococci, 5 per cent. with bacillus coli, 5 per cent. with other pathogenic organisms, as the Koch-Weeks bacillus, and 15 per cent. will show negative bacteriological findings."

More recent figures, collected by American observers, suggest that the gonococcus is present in a still smaller percentage of cases than the one given by Stephenson. Of 167 cases of "suppurative conjunctivitis" reported to the New York City Department during 1914, the gonococcus was demonstrated in but 34, while in 1,376 cases of babies' sore eyes reported to the Boston Department of Health during 1914, but 37 were of gonorrhœal origin.

The late Dr. Mark D. Stephenson of Ohio, writing in this connection, says: "Therefore, it is advisable in the present stage of our work for the prevention of blindness from babies' sore eyes, that the old idea among the public that it is always or nearly always gonorrhœal in its origin, should be corrected. The laity should be taught the plain facts, that while a certain small percentage of cases of babies' sore eyes are caused by the gonococcus, the larger majority of the cases are produced by the various ordinary forms of pus-producing germs that are likely to be found in any mother; and that the presence of babies' sore eyes does not necessarily imply any guilt or wrong on the part of either parent. So long as the disease is thought to be purely gonorrhœal in its origin, there will be associated with its treatment and attempts at its prevention a great deal of unnecessary embarrassment to the family and the physician. If such a belief is prevalent the physician will naturally be afraid, in many families, to suggest the use of prophylactic, fearing that it will be considered a reflection on the character of the mother or father. Parents would also be afraid to suggest, let alone insist on, the use of a prophylactic. As a not necessarily gonorrhœal disease, its public discussion will be much easier; it will receive more respectful attention, and will not be considered a part of the present almost hysterical propaganda with regard to sex hygiene and other subjects that are sometimes too freely discussed."*

In the free public discussion such as Doctor Stephenson suggests lies our hope for a successful campaign against preventable blindness.

Year by year this subject comes up at medical meetings and conferences

* *Journal American Medical Association*, Sept. 12, 1914.

of health officers, nurses and social workers. The statement is made and reiterated that nearly a quarter of the blind children in the schools for the blind in this country are sightless because of a negligent accoucheur. The statement that ophthalmia neonatorum is both preventable and curable has become axiomatic. Almost each year there is written on the statute books of some state a law which is designed to safeguard the eyes of babies. And yet the percentage of ophthalmia neonatorum victims admitted to the schools for the blind year after year varies but slightly, and we are forced to admit with no little chagrin that scarcely more than a scratch has been made on the surface of the problem as a whole.

If the sad procession of little blind children, with state institutions as their goal, is to be eliminated, something more definite and practical will have to be done than the enactment of laws which only become dead letters, and the making of speeches and reading of papers before selected audiences.

Unquestionably, the first step is the enactment of laws providing for the compulsory reporting to local health officers of all cases of babies' sore eyes. This would make possible the provision of medical attention for all uncared-for cases.

But we find upon making a survey of the laws, that more than half of the states (30) require that ophthalmia neonatorum be reported. Why, then, are the babies still going blind? It is because, excepting in very few communities, the law is neither obeyed nor enforced, nor is any action taken when information upon an occasional case of babies' sore eyes does find its way to the local health department. The facilities at the disposal of the average health officer for giving efficient assistance to the physician or the midwife are so limited as to be practically without value.

A nurse should be employed by each local health department to visit each midwife case and to secure such care as is necessary, and also to give visiting nurse assistance to those doctors who wish it; and in addition to this, there should be eye clinics to supplement home care and also such hospital facilities for the reception and care of severe cases of ophthalmia neonatorum that, without an hour's delay, an infected baby and its mother may be admitted and the work of saving its sight begun at once. The importance of admitting the mother with the baby merits attention for the moment. Maternal nursing is advocated for all babies unless for some special reasons it is contraindicated. This is particularly desirable for a sick baby. The baby with sore eyes is a sick baby, and is struggling not only to live but also to combat a severe local infection. Many ophthalmologists express the opinion that the prospect of saving the sight of a bottle-fed baby with sore eyes is at best discouraging.

The value of some such practical work as outlined above has been demonstrated in a few—but very few—of our American cities. In Buffalo, for example, the health commissioner re-

cently notified each physician in his city that babies' sore eyes was a reportable disease and that all physicians and midwives found to be disregarding this legal requirement would be prosecuted, and, in order to assist the doctors, he offered nursing service and bacteriological examinations or would provide hospital care for infants needing more than home care. All midwife cases are visited and supervised by the Department of Health.

It cannot be denied that such work as has been started in Buffalo would be possible for many local health officers, because of the absence of legal authority to act; the lack of facilities with which to carry out the provisions of the law, should one exist; or, what is most important of all, the lack of support of this branch of public health work by the people in the community.

No amount of effort on the part of the health officer can be effective if, after bringing a case into court, the judge dares to throw it out with the remark that "any baby may have sore eyes, just as any one many fall down stairs," as actually happened in Connecticut.

Quite obviously, the crux of the situation is to be found in the educational work, for no amount of legislation will protect the eyes of the individual baby if public opinion is not back of the enforcement.

The public must be so informed and enlightened that the health officer will feel secure in attempting to exercise his prerogatives, and the courts will not dare to disregard the rights of even an infant citizen to the state's protection.

In short, the success of our endeavor to secure the routine use of a prophylactic, the unfailing observation of the reporting law, the employment of a visiting nurse for eye work, and the provision of hospital facilities is really in the hands of the public and rests upon a foundation of publicity.

And just here at this most important point in the whole endeavor is where the harm is done in ascribing all babies' sore eyes to the gonococcus. If we are to have the coöperation of the public at large, which is absolutely necessary to a successful prosecution of this effort, the mind of the same public must be disabused of the idea that infant ophthalmia is a disgrace. Blindness following a streptococcal infection is as endless and dark and tragic as that caused by gonorrhœa and the methods of prevention are the same.

The control and reduction of venereal disease will unquestionably do a great deal toward the prevention of more than one kind of blindness, but it is only fair that the question of babies' sore eyes should be handled impartially; that we make it understood that the disease does not necessarily carry with it a stigma but that any child in any walk of life may have sore eyes and go blind as a result. From the practical point of view of prevention, it does not matter what the organism is that causes the disease. What does matter is that every child's sight shall be safeguarded.

To sum up, if babies are to be saved from blindness the country over, the use of prophylaxis at birth must be routine, and early treatment must be

invariable. The successive steps to be taken are (1) the enactment of laws by state legislatures; (2) fearless and remitting action on the part of local health officers in enforcing these laws; and (3) staunch support and coöperation from the public at large.

This requires public education—widespread and unceasing—sane and unprejudiced.

THE UNUSUAL.

"There has been much ado, there has been much running to and fro, much offering of prizes for miraculous cures developed on short notice, and much newspaper and other talk over the alleged presence of an epidemic of anterior poliomyelitis. It is quite right that there should be active agitation over this disease, but the only reason that there is this unusual stir, is that infantile paralysis is uncommon, and that its epidemics are, for this country, comparatively new. We have had diphtheria and measles and scarlet fever with us for a long time, and yet, we believe, no large prizes have been offered for their cure, no specialists have been hurried to the scene of the epidemic to see what could be done to check its spread, and the national government has never had a hand in its suppression. Even local authorities have seldom taken the trouble to clean up on a large scale in order to check an epidemic of these diseases. Yet the death toll from diphtheria is still approximately 25,000 for the United States each year, the mortality from scarlet fever is six times that from anterior poliomyelitis, while its annual incidence in all our cities usually far surpasses that of the worst outbreaks of the more unusual malady. Even tuberculosis, about which there was a wave of excitement some time ago, is fairly holding its own with a death-rate reduced only from 201 to 147. Infantile paralysis is always present in the community, but it leaves a large percentage of cripples in its wake, and so seems the more dreadful. Doubtless this has something to do with our fear of it, but the crippling from scarlet fever alone, the impaired hearing, damaged kidneys, and heart defects, if not so evident, is more serious than an abbreviated and weakened limb, and the army of scarlet fever cripples is larger than we realize. The same is true of measles, diphtheria, whooping-cough, typhoid, and malaria.

"We become attached to old acquaintances, especially those that were once believed to have been sent for our chastisement and the correction of our evil ways, and perhaps, after all, we like to have the plagues (no one calls *them* such) of the good old infections with us. At any rate, no one is making any great fuss about them commensurate with that which is being made over this less common and less destructive disease.

"Our dollars and cents seem very precious and we use them for other purposes than health protection. We cannot, or at any rate do not, afford even a national department of health, though we do have a department much devoted to the health of plants and animals. We often have no local health departments, and where we have them they are usually badly hampered for lack of both funds and moral support. If popular agitation over the presence of anterior poliomyelitis could only help to open the eyes of the public to the more disastrous but more familiar sources of untimely injury and death—to our other annual disease plagues—we might even be thankful for its prevalence during the past two months."—*New York Medical Journal*, August 19.

Editorial Section

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A REVIVAL OF SHOT-GUN METHODS IN EPIDEMIC CONTROL.

The present is an opportune time to again call attention to the important part which the transfer of the fresh secretions of the nose and mouth plays in the transmission of so many common infections. Health officers must repeatedly impress upon the public the paramount necessity of avoiding contact infection. People should be made to appreciate that they have in their own hands the most powerful weapon to ward off disease. It is not dependent on the efficiency of health officers, or municipal appropriations. Every one can keep the fingers out of the nose and mouth and teach his children to do the same.

The eastern United States have, this year, been visited by two infectious diseases over which official action has as yet obtained little control. In the winter we had influenza. For various reasons the ordinary methods of notification and isolation have no appreciable effect on its prevalence. Yet no one doubts that the individual can do much to protect himself. The avoidance of contact infection and the avoidance of close proximity to persons who are coughing and sneezing are real preventive measures which each one can apply for himself. This was forcibly referred to by Professor Rosenau in remarks printed in the April number of this Journal.

Now poliomyelitis is rapidly becoming widespread. Health departments are unable to formulate methods of control for which they can promise success. While we can say definitely that if certain things are done typhoid fever will surely be reduced; while we can promise the eradication of malaria and yellow fever and can stamp out plague and can give assurance that complete vaccination will banish smallpox, many health officers have adopted a shot-gun policy of recommending for poliomyelitis every known epidemiological remedy in the hope

that one may hit the mark. Individual housecleaning and municipal housecleaning, the avoidance of domestic animals, the extermination of vermin, screening against flies, attention to the food supply as well as personal cleanliness and the avoidance of contact are advised. Is there not danger that in this multiplicity of directions little that is really effective will be done? The public will select the remedy which suits their fancy.

It is a reminder of the persistence of error that there is noticeable today quite a tendency to return to the teachings of the pseudo-sanitarian of fifty years ago and to attempt to stamp out disease by a general clean up. Even in former days, when almost nothing was known of the nature of infection, and very little about its transmission, there was no reason for the old filth theory of disease and for the restriction of the art of sanitation to housecleaning. It has been hoped that this leaf in the history of sanitation had been turned over never to be turned back. It was hoped that the efforts of health officers would hereafter be based on knowledge and not on guesswork. Even in the case of those diseases like typhoid fever and cholera, which in a sense are transmitted by filth, though not bred in filth, a general campaign of cleanliness usually missed the mark. Essentials were omitted and emphasis placed on the wrong thing. Success is attained only when the real danger is known and removed. Clean streets and model garbage rules will never cut down typhoid fever but the removal of privies will. A shot-gun policy in public health work is as absurd and useless as an old time shot-gun prescription in therapeutics.

Unfortunately many influential daily papers have eagerly adopted the suggestion that dirt may be the cause of poliomyelitis and have boldly proclaimed that the latter is a "filth disease" pure and simple and see the only remedy in clean streets and yards. Clean-up campaigns have been inaugurated which are absolutely useless and entirely unwarranted by any knowledge at our command. The filth theory of disease, which it was hoped was dead, shows signs of activity and amateur sanitarians are trying to fan it into life again.

It is true that all too little is known about poliomyelitis, but the facts best established, and well established, are, that the infectious agent is found in the secretions of the mouth and nose, not only of the acutely sick, but of convalescents and healthy contacts. It is also proved that the transfer of these secretions to the healthy mucous membrane of experimental animals gives rise to the disease. Is not the evidence good that the disease is spread by contact much as diphtheria is spread? Are not other modes of transference quite hypothetical? Is it not likely to prove more effective to confine our efforts to what we know? We should in no uncertain manner make it clear that the essential feature of the official control of this disease is the isolation of infected persons. It is also safe to teach that every one, to a large extent, is responsible for his own protection. If the fingers never go to the nose, or mouth, and if nothing goes to the mouth except clean eating utensils and clean food the danger of contracting poliomyelitis and the whole numerous group of saliva-borne diseases will be reduced to a minimum.

THE PERIOD OF LIFE AT WHICH INFECTION FROM TUBERCULOSIS OCCURS MOST FREQUENTLY.

HOW MAY WE DIMINISH THE FREQUENCY OF THOSE INFECTIONS AND PREVENT THEM FROM BECOMING TUBERCULOUS DISEASE?*

WITH APPENDED NOTES ON A SUCCESSFUL ANTITUBERCULOSIS COMMUNITY EXPERIMENT IN AUSTRALIA AND A PROJECTED ONE IN AMERICA.

S. ADOLPHUS KNOFF, M. D.,

Professor of Medicine, Department of Phthisiotherapy at the New York Post-Graduate Medical School and Hospital; Visiting Physician to the N. Y. Health Department's Hospital-Sanatorium for the Consumptive Poor.

Read before the Public Health Administration Section, American Public Health Association, Rochester, N. Y., September 8, 1915.

This paper not only contains Doctor Knopf's own valuable conclusions upon the subject presented, but it is also a compendium of the opinions which Doctor Knopf has secured from a number of other eminent physicians.

FOR a soldier, whether in time of peace or war, whether fighting in defense of his country and obliged to kill or fighting an insidious enemy like tuberculosis and thus seeking to save life, the first duty is to obey. Even if in his own judgment the task assigned to him seems impossible, if his superior officer commands it he must do the best he can.

These were about the thoughts that came to my mind when my superior officer, Dr. W. S. Rankin, the Chairman of the Program Committee, assigned to me the above topic to present before the Public Health Officials' Section at this meeting. I asked myself, who knows anything about the period of life at which infection from tuberculosis occurs most frequently? I was sure I did not. My own statistics tell only of the occasionally recalled exposure to infection during adult life and of the cases of tuberculosis of either parent where there was a likelihood that infection had taken place some time during infancy or childhood, or even later, but at what exact age I had no way of knowing. In fact, I always thought that while it is possible to get statistical data of the period at which the tuberculous disease manifests itself, it is utterly impossible to determine the exact period of infection. But I was not going to be discouraged because of my own ignorance, and the fact that I did not know the period of life at which infection from tuberculosis

* A revised and enlarged article which was originally the subject of an address delivered by invitation before the American Public Health Association at its 43d Annual Meeting in Rochester, N. Y., September 8, 1915.

occurs most frequently did not at all mean that others might not know a good deal about it. So in order to carry out the program, I determined to find out what information I could get on this subject.

I wrote forty letters to well-known specialists on tuberculosis and to internists who see a good deal of tuberculosis in their consultation practice, and twenty letters to well-known authorities on diseases of children.

I asked for the percentage of children infected with tuberculosis in general, at what age in particular, and what organs were most frequently involved. I then asked for the method of invasion and how often the infection could have been considered pre-natal. I then tried to ascertain at what period of life an infection, contracted in infancy or childhood, had the greatest likelihood to become active, and at what period of life in general tuberculosis had been found most frequently in the adolescents and the adults. Lastly, I asked my correspondents, in case no statistics were available, to favor me with their general impressions on the subject.

Many of my correspondents did not fail to impress upon me the difficulty of the task I had undertaken; some wrote encouragingly and some discouragingly, but all agreed on the great vital importance of such a study. Following are quotations from a few of the letters I received:

From our beloved Dr. E. L. Trudeau, the great scientist and scholar, friend and beloved physician, whose recent passing away deprived us of the greatest American authority on tuberculosis, but who, let us hope, has left with us his spirit, his enthusiasm, his devotion to the cause and inspiration to go on and on with the work, I received the following kindly note: "You must excuse me from answering the questions you are asking the rest of the profession. To be accurate it would involve an amount of work which I really don't think I can give to it. I hope the result of your inquiries will throw some light on this very obscure question."

Dr. Lawrason Brown, of Saranac Lake, said: "Really an inquiry such as your question would indicate would settle the whole matter and it seems to me almost impossible to determine the answer to question 6 (concerning mode of invasion). This would be largely guesswork, but if it could be based on scientific research would settle many vexed questions. I might say that I feel that the whole subject of etiology should be gone over again and some of us here are planning to do a little work in the matter."

Prof. S. Solis Cohen, of Philadelphia, said: "I shall be much interested in the result of your studies, and especially in your conclusions from your own statistics, which to me would be of vastly more importance than the guesses of all the rest of us put together." (I wish the good doctor would be half right in this assertion.)

Prof. Theodore C. Janeway, of Johns Hopkins, wrote me from his summer home: "The problem you have taken up seems to me one of the most fundamental for our understanding of the mode of infection in tuberculosis and for the selection of effective measures

of prevention. Exact statistics from a large number of sources on each of the points you raise will be of great help towards its solution. I wish I might contribute some, but I am entirely out of reach of my data, which are in Baltimore. I am most anxious for light on this problem and shall await the results of your study with great interest."

Prof. William P. Lucas, of San Francisco, makes the following significant statement: "I should be very glad to see your report lead to some immediate and definite attempt to really take up the subject from a statistical and scientific standpoint on a large scale throughout this country including all the children's hospitals in at least the university centers."

Dr. David R. Lyman, of the Gaylord Farm Sanatorium, wrote me: "I greatly regret that it is impossible for me to find time to go through my records for the data for which you ask. I recognize the great importance of the question and the need for its presentation and discussion."

Prof. John L. Morse, of Boston, writes: "It seems to me that in general a great many statements are made regarding tuberculosis in infancy and childhood on an insufficient basis. It seems to me, moreover, that a great deal of the discusson which is now going on about tuberculosis in childhood is in relation to entirely unimportant points and that there is danger of overlooking or neglecting the few important points."

Dr. Joseph E. Winters, Professor of Clinical Medicine, New York, writes: "My experience at Cornell and elsewhere convinces me that the diagnosis of tuberculosis in children is at present too hastily made and on insufficient evidence. Tuberculosis in childhood is not a latent disease as in adults. With the exception of glandular tuberculosis, it is an active and rapidly progressive disease. Its symptoms and signs are distinct, clear, and unmistakable. Would that I had the time to devote to the subject which it merits."

My good friend, Dr. Charles L. Minor, of Asheville, N. C., does not think a lifetime enough to go over his statistics, and this is what he says concerning them: "I have a vast amount of carefully kept histories, but I have no time to get up statistics out of them, and I expect I will be dead before that opportunity offers. In fact, I think we could have a very nice time in heaven going over and catching up with the work we had begun on earth." May Doctor Minor be spared a long time to continue his work on this earthly sphere, but when the time does come for him to pass to his heavenly abode and reward, I hope he may find more pleasant work to do in the other world, unless of course he should find working on tuberculosis statistics the most congenial heavenly occupation.

I must quote from another letter received a few months ago, not amusing and cheerful like the foregoing but, on the contrary, deeply sad and depressing, coming from the war zone where they are trying to do the very reverse of that for which we are assembled here. While we are bending all our energies to save life, prevent

untimely death and to further human happiness and peace, in Europe at this very moment they are sacrificing the best and most virile youths of the nations, killing and maiming thousands and sowing the seed of hatred and enmity among the nations. This must have been the thought of the Regius Professor of Oxford, Sir William Osler, when he wrote to me. This great man, though far removed from us, still takes the keenest interest in the work of his American pupils and friends. After giving me most valuable bibliographical indications, he says: "I am afraid I would not have time to look over my material and answer those questions intelligently. We are all working hard here. It is an awful business. One of the worst features is that it will dig an intellectual gulf between Germany and this country for generations. Let me have the results of your studies." May the great doctor's prophesy not come true and an early and lasting peace again unite the nations.

Professor A. Jacobi, that grand old man, eighty-five years young, sent me from his summer home a five-page letter, closely written in his own hand, giving me a wealth of information. At the end of this remarkable document full of bibliographical references and narrations from his own vast experience, he modestly says: "I am sorry I cannot contribute anything to your work, being in the country and having nothing in this desert that will add to your riches." Of course the good doctor refers to the riches of information I was supposed to have gathered from other sources since I have confessed to having none of my own.

Many other letters began with the usual regret not to be able to answer all my questions or some of them, or even any at all, because of lack of statistics, but from what follows you will see that a goodly number of my correspondents have most kindly aided me by letting me have whatever statistics they had or giving me the general impressions resulting from their vast experience. Adding to this whatever important enlightenment I could find by the perusal of the more recent current literature, I believe I have after all been able to come to some conclusions, and from them we may perhaps be able to outline some effective measures to diminish the sources of infection and to prevent the tuberculous infection from becoming tuberculous disease.

The answers to my first question, concerning the frequency of tuberculosis in general in childhood, would give an average of about 36 per cent.

Prof. Norman Bridge, Los Angeles, gave it as 22%
Prof. S. Solis Cohen, Philadelphia, gave it as 10%
Dr. Alfred F. Hess, New York, gave it as 38%
Prof. Godfrey R Pisek, New York, gave it as 65%
Dr. Bertram H. Waters, New York, gave it as 26%
Hamburger and Monti, in *Amer. Jour. of Dis. of Child.*, Vol. 9, No. 6, June 1915, gave it as 59%
Veeder and Johnston, in same issue, gave it as 34%

From the interesting opinions given in answer to this inquiry I desire to quote the following:

Prof. Vincent Y. Bowditch, of

Boston, thinks latent tuberculosis is more frequent in children than has hitherto been supposed, only to become active in young or adult life.

Prof. Edward O. Otis, of Boston, writes: "I believe a large number of children have a tuberculous infection but comparatively few develop active clinical pulmonary tuberculosis before adolescence. Such I should say had been my experience."

Prof. Wm. P. Lucas, of San Francisco, feels strongly that it is time to differentiate between infection and disease in children. He believes that most city children become infected and in most cases produce definite immunity.

Dr. Alfred Meyer, New York, thinks the percentage higher than usually supposed in febrile cases without superficial evidence, such as lymphad and joint lesions, and that these cases are wrongly regarded as typhoids (even three or four attacks).

Prof. John L. Morse, Boston, says tuberculous infection is of course very common while tuberculous disease is relatively rare.

Newsholme, in *Lancet*, June 12, 1915, in the section referring to inaccurate diagnosis in children, quotes striking figures from Coates and Landouzy on the question of the prevalence of tuberculosis in children and also in relation to deaths. He states that "In children the term broncho-pneumonia not infrequently conceals acute tuberculosis, especially when the 'broncho-pneumonia' occurs after imperfect recovery from such diseases as whooping-cough and measles."

Concerning the various ages at which infection has most likely occurred, I received the following replies:

Dr. Alfred F. Hess, New York	Years. Under 1, 5% 1 to 2, 33% 2 to 3, 75%
Prof. John L. Morse, Boston	Infection and disease increase steadily with age.
Prof. Godfrey R. Pisek, New York	Year. 1st, 14% 2d, 50% 3d, 65% 5th, 60% 7 to 14th, 70%
Prof. Geo. M. Tuttle, St. Louis	Most frequent under 5 years of age.
Prof. J. A. Miller and Dr. I. O. Woodruff (*Jour. of A. M. A.*, March 27, 1909)	In children of tuberculous parents who live in close association with them, between 2 and 15 years, 51%
Prof. Hamburger of Vienna, in *Handbuch der Tub.*, Bd. V, 1915, gives the following table	Year. 1st, 1% 2d, 9% 3d to 4th, 27% 5th to 6th, 51% 7th to 10th, 71% 11th to 14th, 94%
My own statistics reveal the following	Infection occurred apparently in children: Years. 1 to 5, 9% 5 to 10, 34% 11 to 15, 12%

Prof. Theodore Le Boutillier's remarks in answer to this question are likewise of intense interest. He says that he found that infection occurs with comparative infrequency during

early infancy when the child has been removed from the infected surroundings. He never found it to occur under these conditions. Where, however, the child remains in the infected surroundings, he thinks that, as a rule, these infants become actively tuberculous within the first year of life. It occurs most frequently during the second five years of life and then at puberty.

To the question which of the organs were most frequently involved, nearly all my correspondents united in the opinion that in children the lungs and lymph nodules were primarily and most frequently involved; secondly, bones; thirdly, intestines; fourthly, meninges.

I will quote from the remarks I received in answer to this question as follows:

Dr. E. R. Baldwin, of Saranac Lake, referred me to his article in Osler's System of Modern Medicine, last edition, in which he says: "In the majority a previous focus must be regarded as essential although infection through the tonsils or by way of the cribriform plate of the ethmoid may be possible. The most frequent lesion is in the lungs (50 per cent.), glandular tuberculosis probably comes next in frequency, and then joint, bone, genito-urinary, and pleural lesions."

Prof. Theo. Le Boutillier, of Philadelphia, thinks that the younger the child the more likely it is to be meningitis, next in frequency miliary tuberculosis; in older children, pulmonary, glandular and bone.

Prof. Wm. P. Lucas says that acute tuberculosis, in his experience, is nearly always found in infancy and rarely during childhood unless the infection is very virulent or quantitatively large. After five years of age the number of acute cases even of tuberculous meningitis or miliary tuberculosis diminish very rapidly. He has no absolute percentage from his own experience but thinks that practically all the infections are glandular, either peribronchial, peritoneal, or cervical and that the other forms of tuberculosis, bone, etc., are secondary to the glandular involvement.

Dr. Alfred Meyer has always been surprised at the comparative rarity of acute miliary and of meningitis considering the very favorable conditions for dissemination.

Prof. John L. Morse supposes that tubercular meningitis and miliary tuberculosis were always secondary to some previous infection.

As to the method of invasion, Prof. John Howland, of Baltimore, gave 95 per cent. through close personal contact with tuberculous individuals; Prof. Godfrey R. Pisek of New York 75 per cent.; Profs. Hermann M. Biggs and Henry D. Chapin of New York, William P. Lucas of San Francisco, and George M. Tuttle of St. Louis, concur in the opinion of Doctor Howland.

In our Health Department's clinics, Dr. Bertram H. Waters traced the majority of infection to the respiratory tract. My own statistics made me come to the same conclusion.

Somewhat divergent is the view expressed by Prof. Frank Billings of Chicago, who says that to him it seems that the most common source of the infection in the child and

adolescent is through the digestive apparatus, either from infected milk or other food substances or quite as frequently from actual contact with tuberculous adults and the contamination of hands, lips, etc., and with tubercle bacilli which gain entrance through the mucosa of the throat. He often wondered if this method of contact infection is not frequently present even in the adult rather than infection through infected air as is the commonly accepted mode. In other words, the last named mode of infection it seems to him is a very common one in both children and adults.

Prof. L. Emmett Holt, on the other hand, says that it has always been his belief that the dangers from tuberculous milk have been greatly exaggerated, certainly with infants and young children.

Prof. John L. Morse says that he has seen a considerable number of cases in which children with tuberculosis had taken the milk from tuberculous cows. He does not know, however, whether their infection was from the tuberculous milk or whether it was acquired in some other way.

As appertaining to this question we must add the following: Prof. William Charles White of Pittsburgh writes that in no way could he see that it is possible for us to trace the origin of infection from without although, in most of our general tuberculous cases, on which we have had autopsies, it is possible to trace infection from some glandular source of infection within the body.

Prof. Godfrey R. Pisek says, infections with human bacilli, in all probability, are the latent types; the bovine type of infection does not seem to remain latent and to develop in later life; perhaps this type even confers a certain immunity.

Prof. Beverley Robinson of New York says: "The pulmonary organs are those most frequently involved, as I believe, and that is also the impression of very many general practitioners."

My question concerning the frequency of prenatal infection received the least number of responses. Prof. Norman Bridge thought he had seen two cases; Prof. John Howland also two cases; Prof. A. Jacobi reported one case. Myself I believe to have observed two distinct cases of prenatal infection. Professor Pisek believes that only fifteen authentic cases have been reported. And yet, it seems to me this rarity is perhaps only apparent and the reason for it is to be found in the fact that autopsies in children are not made nearly as frequently as in adults. There have been a sufficient number of cases on record, however, to make it necessary to consider this direct bacillary transmission from the mother as one of the means of tuberculous infection, particularly when the mother has been acutely ill at the time of conception or during pregnancy.

This prenatal infection may also explain the occurrence of tuberculosis in early infancy, that is to say before the first year. Gärtner, of Jena ("Ueber die Erblichkeit der Tuberkulose," *Zeitschr. f. Hygiene u. Infektionskrankheiten*, Bd. XIII), who

made very extensive animal experiments in the endeavor to remove all doubts about this much disputed question, comes to the conclusion that the experiments with rabbits and guinea pigs disprove the possibility of the transmission of the tubercle bacillus from the father to the fœtus. When bacilli are very numerous in the semen, the mother becomes infected but never the offspring. On the other hand, the clinical reports and his own animal experiments have convinced him that tubercle bacilli are frequently transmitted from the mother to the child during the latter's prenatal existence.

Some time ago I had the honor of a conversation with Prof. Wm. H. Welch of Johns Hopkins Medical School on the subject and he, too, was of the opinion that a direct bacillary transmission, that is to say, prenatal infection, takes place much more frequently than is generally believed.

Prof. S. Solis Cohen says it is difficult to distinguish between prenatal infection, hereditary tendency, and infection early in life. He does not see a sufficient number of very young infants to be able to exclude the latter method in any instance.

Prof. A. Jacobi says that while direct heredity is rare, hereditary predisposition to tuberculosis is quite frequent, and is transmitted even by such parents as appear to be in fair health. It is evident that the newly-born cannot be safe with its consumptive mother.

As to the certainty that predisposition is frequently inherited from a tuberculous mother or a tuberculous father, an anæmic parent, or parents of feeble health or generally below par, there is of course not the slightest doubt. Any inherited systematic weakness of the child, which might be more properly called a physiological poverty, renders the child naturally more susceptible and less resistant to invasion of tuberculosis or other infectious diseases. When the mother is the tuberculous parent, this predisposition is all the more likely to be inherited because of the impregnation of the cells of the fœtus by the toxins of the tubercle bacilli, even if the latter have not been found in sufficient numbers in the cells to demonstrate direct bacillary transmission.

To the question at what period of life a tuberculous infection, contracted in infancy or childhood, was most likely to become active, I received the following answers:

Dr. W. Jarvis Barlow, Los Angeles, at 15 years.
Prof. Hermann M. Biggs, New York, between 6 and 25 years.
Prof. S. G. Bonney, Denver, between 18 and 25 years.
Prof. Vincent Y. Bowditch, Boston, at 15 years.
Prof. Norman Bridge, Los Angeles, between 15 and 18 years.
Dr. E. S. Bullock, Silver City, N. Mex., between 18 and 25 years.
Prof. Theo. Le Boutillier, Philadelphia, at 15 years.
Prof. Wm. P. Lucas, San Francisco, at 15 years.
Dr. Alfred Meyer, New York, at 10 years.
Dr. Charles L. Minor, Asheville, before 16 years.
Prof. Wm. P. Northrup, New York, between 3 and 12 years.
In my own experiences, I found that early infection had become active between 10 and 30 years.

The remarks on this question are significant and I will quote the following:

Dr. Alfred F. Hess, of New York, does not believe that the age is such an important factor as regards making an inactive process active, as is the general condition of the individual. Independent of age, if a person has measles, marked anæmia, or malnutrition from whatever cause, there is liability of the lighting up of the tuberculous focus.

Dr. G. W. Holden, of Denver, thinks a latent infection will not develop until such a time as the natural resistance has been broken down and vitality lowered, due to overwork or overplay, or a combination of both.

Prof. L. Emmet Holt, New York, thinks that age seems to have much less influence on this point than other conditions, such as season of year—winter and spring—and the development of intercurrent diseases such as measles, whooping-cough, influenza, and bronchitis.

Dr. David R. Lyman, of Wallingford, Conn., says that his own general impressions based chiefly upon the histories of his cases is that where an intelligent history is obtainable a very large percentage of our adult cases can be traced back to early youth or childhood, and that our future work must be devoted mainly to the prevention of tuberculosis in childhood.

Prof. Wm. Chas. White thinks that there is no period in life when tuberculosis may not be contracted.

Prof. Godfrey R. Pisek thinks the period of life in which latent tuberculosis is most likely to become active begins about the fifth year; this includes no observations after the fourteenth year of life.

To my last question, what was the age at which tuberculosis was found most frequently in the adolescent and the adult, I received the following answers:

	Years.
Dr. W. Jarvis Barlow, Los Angeles, gave the age at	20 to 29
Prof. Hermann M. Biggs, New York, gave the age at	16 to 25
Prof. Frank Billings, Chicago, gave the age at	15 to 25
Prof. Vincent Y. Bowditch, Boston, gave the age at	20 to 40
Dr. E. S. Bullock, Silver City, N. M., gave the age at	18 to 25
Dr. G. W. Holden, Denver, gave the age at	20 to 25
Prof. S. Solis Cohen, Philadelphia, gave the age at	18 to 22
Dr. Alfred Meyer, New York, gave the age at	15 to 40
Dr. Chas. L. Minor, Asheville, gave the age at	20 to 40
Prof. Edw. O. Otis, Boston, gave the age at	18 to 35
Dr. Bertram H. Waters, New York, gave the age at	25 to 40
Prof. Wm. Chas. White, Pittsburgh, gave the age at	20 to 40
In my own experience I found tuberculosis to be in evidence most frequently between	15 and 40

Of 1,000 private cases of adults of which I kept careful records, only 14.5 per cent. recalled an evident exposure to infection outside of their family circle during their adult existence as a possible cause of their disease. On the other hand, 33 per cent. stated that either father, mother, brother, or sister had died of tuberculosis or had been ill with the disease. In these cases we have reason to believe that infection occurred most likely during infancy or childhood.

The general impressions which were kindly given me by my correspondents

concerning my inquiry as to when a tuberculous infection became a tuberculous disease, or when the disease was first noticed in the adolescent or the adult, are to my mind fully as valuable as the statistical data.

Dr. Herbert M. King, physician-in-chief of one of our largest sanatoria where the vast majority of patients come from the well-to-do classes, writes as follows: "Speaking very generally, I think I share a widespread impression, amounting to almost conviction, that most of the cases of tuberculosis developing in adult life may be traced to infection received before adolescence."

Dr. Lawrence F. Flick, of Philadelphia, says: "From my experience in tuberculosis and from the studies I have made of the subject, I am led to believe that ordinary tuberculosis is implanted in early life and either remains dormant or grows very slowly until adult life is reached. My histories of cases taken as a whole would indicate that ordinary tuberculosis has existed for many years when a case comes under observation for the first time. The implantation undoubtedly most frequently takes place in the home through prolonged intimate contact with an open ulcerative case of tuberculosis in the intimacy of family life."

Prof. Wm. C. Hollopeter, of Philadelphia, writes: "I am a great believer in the early implantation of tuberculosis in children and believe that all children have it with very rare exceptions, the adult form is simply a recrudescence, or an expression due to lowered resistance of the individual."

Prof. John Howland, of Johns Hopkins, says: "We have had, in the dispensary and hospital, since I have been in Baltimore, 8,293 patients. Of these, 469 had tuberculosis recognizable in some form or other and we have not made the diagnosis of tuberculosis unless, in addition to the symptoms, tuberculin tests showed the presence of the disease. I have not included in this those patients, that, without other evidences of tuberculosis, gave positive von Pirquet reactions."

Dr. Martin F. Sloan, Superintendent of the Maryland State Hospital for Consumptives, writes: "I do not remember having seen one adult with a so-called acute invasion in whom a chronic lesion was not demonstrable in one of the apices. My limited experience leads me to believe that practically all cases of pulmonary tuberculosis in the adult are of endogenous origin. A carefully obtained history from an observing patient most frequently reveals one of a number of several manifestations of tubercle bacilli infection in early life, viz., nasal catarrh or middle ear trouble, tonsils and adenoids, 'white swelling,' malnutrition, 'winter colds,' enlarged cervical glands, at puberty, amenorrhœa, or irregular menstruation, nervousness, and poor development; and later, pleurisy, chronic bronchitis, 'typhoid pneumonia.' In other words, we find stepping stones, if you will, connecting an infection in early childhood with the pronounced case of consumption in adult life. This leads me to say, parenthetically, that I consider the critical periods of a woman's life, in so far as tuber-

culosis is concerned, are puberty, puerperium, and the climaterix; of a male's puberty, and about thirty to thirty-five years.

"Again, a careful history nearly always shows that at least one brother or sister, or maybe more, has had suspicious symptoms. I know several families that have been exterminated by consumption, though the members had been separated since childhood, all of which would seem to indicate an infection through a common carrier in early life, very likely a parent, nurse, or housemaid.

"On the other hand, I know of no employee about the sanatorium who has become a victim of the disease. After seven years' exposure I myself show no signs or symptoms of the disease. I must confess I am somewhat dubious of the frequency of adult infection, except in cases of the closest contact, such as is to be found in marital life."

Dr. Charles L. Minor, of Asheville, writes: "In my own experience I have found in the adolescent, the largest number of cases of tuberculosis appearing at about sixteen. In the adult the large majority have been between twenty and forty."

Prof. Wm. S. Thayer, of Baltimore, wrote: "As time has gone on I have been very much impressed in a purely general way with the feeling that most tuberculosis was acquired in childhood, but, alas, when it comes to a question of proof or even of strong evidence to support my feelings, I have it not. I have a very general feeling that glandular tuberculosis is especially common in childhood and I would be inclined to believe that most pulmonary tuberculosis was rather largely an autogenous infection from such early glandular foci, but, as I have said, I cannot feel that I am justified in expressing more than an impression with regard to the question. I shall be much interested to see your final conclusions."

Prof. John L. Morse, of Harvard Medical School, writes: "Both tuberculosis infection and tuberculosis disease are far more common among the poorer classes than among the well-to-do."

This statement that tuberculosis infection as well as tuberculosis disease is the lot of the child of the poor is borne out by the statistics furnished me, particularly those of Dr. Alfred F. Hess, who writes: "Among the children at the Infant Asylum who may be considered about the average of those living in the tenements, we have found that three-fourths of those under the age of five years give a positive von Pirquet test."

In these children, 75 per cent. means not infection but tuberculous disease, more or less active, for below the age of five the infection has rarely had a chance to become latent and the slightest additional pathological process, such as measles or anæmia, or simply malnutrition, is sufficient to produce a general and often fatal tuberculosis.

To make a brief summary of results from this little study, we would have to say that tuberculous disease in childhood, compared with tuberculous infection, is relatively rare (36 per cent.); that, on the other hand,

tuberculous infection is exceedingly frequent, generally speaking, and, according to exact statistics as well as general impressions given by men of vast experience, the majority of the cases in the adult had their origin in an infection during infancy or childhood.

The frequency of infection increases with the age of the child, and of course is also affected by the environment the child comes from.

	Percentage.	
	Lowest.	Highest.
Under 1 year,	1%	9%
From 1st to 3d year,	9%	50%
From 3d to 5th year,	27%	75%
From 6th to 10th year,	34%	75%
From 11th to 15th year,	(private) 12%	(hospital case) 94%

As to what organs are primarily most frequently involved, statistics and impressions give lungs and lymph nodules. Prenatal infection, while considered rare, is perhaps much more frequent than statistics show.

The age at which a tuberculous infection, contracted in infancy or childhood, becomes active is, according to the majority of my correspondents, at or shortly after fifteen years; next between eighteen and thirty years.

The ages at which tuberculosis was diagnosed and apparently contracted most frequently in later life, were given as most frequent between twenty and thirty-five years.

Nearly all the authorities consulted unite in the opinion that, in order to combat tuberculosis successfully in the young and the old, we must diminish the sources of infection in childhood.

And now, in conclusion, let me rapidly enumerate the measures which I hope and believe may tend to diminish this frequency of infection and when it does occur prevent the disease from developing.

(1) We must seek to amend the federal and state laws which make it a criminal offense for a duly licensed physician in good standing to give advice concerning the means of preventing conception. We must be allowed fearlessly and openly to instruct tuberculous parents how not to procreate a tuberculous race.

(2) All cases of open tuberculosis, particularly the pulmonary and laryngeal types, should be required by law to be reported to the health authorities who in turn should be authorized to send the patient directly, or through the attending physician, carefully worked out instructions to prevent infecting others.

(3) Cases which cannot be properly taken care of in the home, or when it is evident that they constitute centers of infection, should be transferred to sanatoria, special hospitals, or at least to special wards in general hospitals. Every community should have sufficient facilities to take care of such cases. The board of health of every community should have police power in order to be able to isolate such cases which wilfully disseminate bacilli by indiscriminate expectoration or by other unclean habits, thereby exposing other members of the family, particularly children, to contracting the disease.

(4) For the pregnant tuberculous woman there should be a maternity

sanatorium or a special ward in existing maternities where prolonged antituberculosis treatment can be effectually carried out and where mothers can receive such instructions as will guard their offspring from post-natal infection.

(5) Where there is the slightest suspicion of tuberculous infection of the infant by the mother, the child should have a healthy wet-nurse or should be bottle-fed. The preparation of the milk and bottles, testing the milk to judge of its sweetness and temperature, etc., should be attended to not by a tuberculous mother but by an intelligent and conscientious healthy person, unless the mother is scrupulously clean and knows how to take every proper precaution against infection. For infants whose mothers for one reason or another are unable or not intelligent enough to care properly for their tuberculous offspring, there should be established special preventoria. The need of such institutions has been very ably set forth in a recent contribution by Dr. Alfred F. Hess of New York, entitled "The Neglect to Provide for the Infant in the Antituberculosis Program."*

(6) Enterprises similar to the one inaugurated by my regretted teacher, the late Professor Grancher of Paris, for the purpose of providing medically supervised country homes for the tuberculous mothers and their children until they can safely return to city environments, should be helped by private philanthropy, or, better yet, by the aid of the municipality.

(7) All children under five years of age, be they of poor or rich parentage, should be subjected annually or even semi-annually, to the von Pirquet test, and all who react positively and have in addition symptoms and physical signs should be placed under proper treatment at home, in preventoria, or sanatoria.

(8) All children between five and fifteen years of age, particularly those attending public schools, should be subjected to a careful physical examination on entering as a pupil and an annual reëxamination thereafter, always accompanied by a von Pirquet test. Those reacting positively and showing physical signs, those evidently strongly predisposed to tuberculosis, anæmic, highly nervous or afflicted with cardiac disease, should, according to their condition, be placed in open-air classes, open-air schools, preventoria, seaside or inland sanatoria. This will probably mean that open-air schools must become the rule and the indoor class the exception which indeed would be a great blessing. It goes without saying that all physical defects, such as adenoids, enlarged tonsils, deviated septi, must be removed so that the child's upper respiratory tract may be as nearly perfect as possible. Defective hearing and eye-sight, as well as bad teeth, must, of course, also receive proper attention.

(9) Open-air instruction should be practised whenever feasible. Singing, recitation, geology, botany, etc., should be taught out-of-doors. Calisthenics, breathing exercises, and swimming lessons should constitute a part of the curriculum of every public and private

*Jour. Amer. Med. Ass'n, Dec. 19, 1914.

school. No public school should be without its swimming pool. A drill in swimming so as to know how to save one's own or perhaps other lives, should be as essential as fire drills in public schools. Wherever shower baths and swimming tanks (the former to be used prior to entering the latter) form a part of the public school equipment, pedagogues have observed a better morale and better work done by the pupils. The curriculum of our schools should be arranged so that the mental and intellectual training is not carried to the extent of becoming detrimental to the physical development and well-being of the children.

(10) The school authorities should have the right to investigate the home of any child attending public school when the teacher or school physician thinks that underfeeding, bad sanitary home environments, or child labor at home, are responsible for a poor physical condition of the pupil which might develop into tuberculosis.

(11) Child labor in factories, mines, canneries, stores, workshops, in the street or at home, must be done away with if we wish to raise a non-tuberculous race. Up to the age of fourteen every boy and girl should have the right and privilege to play and not be forced to work. When arriving at the age of puberty, the boy or girl should be in the best possible physical condition or else there is a great likelihood that a latent tuberculosis or inherited predisposition will develop into tuberculous disease. Playgrounds and parks should be in abundance in every civilized community. The roofs of schools and tenements should be converted into roof gardens when the ground is scarce and expensive, as for example in New York City.

(12) There should be an obligatory examination for tuberculosis and other serious diseases of every boy or girl prior to entering college, the store, the workshop, the office, mine, factory, or any occupation for his or her career in life. The physical and mental test at such a time should be used as a guide in the choice of trade or profession.

(13) There should be periodical examinations for tuberculosis of all employees in whatever sphere of activity—in office, factory, workshop, hotels, households, schools, municipal or federal departments, etc.

(14) For those weeded out as tuberculous or afflicted with other diseases which incapacitate them for their usual work under ordinary conditions, there should be agricultural and industrial colonies where these semi-invalids will have nevertheless an opportunity to earn a livelihood. There also the graduates from sanatoria should be sent for an opportunity to regain strength and vigor, to make their cure more lasting, and above all to learn again to earn their living.

(15) There should be state insurance or obligatory private insurance against accident, old age, and diseases including tuberculosis for all earning less than $1,000 per annum, so that those fearing temporary or total loss of earning capacity will not be afraid to seek proper treatment in tuberculosis institutions.

(16) Although the investigations, the replies from eminent authorities,

and the literature consulted seem to show that the bovine type of the bacillus of tuberculosis at a maximum estimation is not responsible for more than 10 per cent. of tuberculosis in childhood, we must not allow ourselves to lessen our efforts to combat the disease in animals. We should not have individual and widely differing state laws but instead uniform bovine laws enforced by federal authorities in all states of the Union alike. Only thus will we be able to combat the source of infection for human beings which comes from the bovine race.

(17) With all this there must be a continued propaganda for the education of the masses concerning the prevention of tuberculosis, alcoholism, and other social diseases; for the improvement of housing conditions including the supervision and better sanitation of city and country schools, of lodging houses, boarding houses, factories, workshops, stores, offices, asylums, prisons, and reformatories; for the prevention of injurious overwork; for healthful recreation of the masses in city and country; for the return to the soil from our overcrowded cities; and above all, for a living wage for all who labor honestly and efficiently and a rational and speedy solution of the problem of unemployment.

I grant that this is an elaborate and extensive program, but if you take into consideration the financial sacrifices this nation is annually making to combat tuberculosis, you will perhaps see the justification of it. In spite of all our efforts, we are still losing about 200,000 people annually from tuberculosis in the United States, of which, I venture to say, 50,000 are children. Estimating the average duration of life of these 50,000 children at about seven and one-half years, and figuring the cost to parents and the community for each life as only $200 per annum, the financial loss thus represented is $75,000,000. These children have died before they have been able to give any return to their parents and the community. What a useless sacrifice of life and of money! How much needless sorrow and heartaches caused to parents!

Besides all this, many a tuberculous mother has had her life shortened because she bore one of these children. According to the report of the Commissioner of Education, there are at this time about 20,000,000 children attending public schools in the United States. Placing the proportion of tuberculosis among them as low as only 3 per cent., would make 600,000 children afflicted with tuberculosis who are at this time in urgent need of open-air instruction or sanatorium treatment. According to available statistics, we can at present provide instruction in open-air classes for about 2,000 tuberculous children. The anæmic, the nervous, and the children suffering from cardiac diseases, who are in equally great need of outdoor instruction, are not included in the 3 per cent.

The 150,000 adults who die annually of tuberculosis have on the average been ill and incapacitated for work for at least two years, and figuring their cost to the commonwealth (either to municipality or individual family) at

only $1,000 per year, would mean $300,000,000 uselessly spent in caring for people afflicted with a disease that might have been prevented or cured. Of these 150,000 adults, a large number have been married and in many instances leave either widow or orphans depending upon public support. The annual maintenance of these widows and orphans must, of course, also run into the millions. We have thus an annual expenditure of well-nigh $400,000,000. Yet this by no means represents all the actual loss to the community from tuberculosis. Our social economists tell us that between the ages of sixteen and forty-five every adult life with an average earning capacity represents an asset of $5,000 to the community. Now, as two thirds of all deaths from tuberculosis in adults occur between these ages, we have an additional loss of $500,000,000. Thus, the actual direct and indirect loss caused by deaths from tuberculosis in the United States amounts annually to something like $900,000,000, and this amount we spend on a preventable and curable disease!

We must also bear in mind the fact that we have at least eight times 150,000 tuberculous adults, for it is well known that for every individual who dies of tuberculosis there are eight living with the disease, still up and about, and the majority of them with an opportunity of spreading infection. Besides these, there are 400,000 to 600,000 tuberculous children. By reason of lack of open-air schools, preventoria, sanatoria, special hospitals, and horticultural, agricultural and industrial colonies, the vast majority of nearly 2,000,000 tuberculous individuals continue the chain of infection and keep up our fearful morbidity and mortality at an expense of $900,000,000 per annum.

To carry out the program I suggest will not cost us $900,000,000 a year. If at first it should even approach this vast sum, within a very few years the expenditure as well as the morbidity and mortality from tuberculosis will be reduced to a minimum.

This little study, inadequate and doubtlessly defective in some respects, has nevertheless convinced me that there never will be a solution of the tuberculosis problem if we do not attack tuberculosis in infancy and childhood. This must be done first by diminishing the sources of infection; secondly, by curing the curable.

While I am willing to grant that an early and benign infection may be an immunizing factor, we know that it is neither universal, permanent nor complete, hence we must spare no efforts to diminish all sources of infection. It is the safer way. The measures outlined will prevent a benign infection from becoming disease and render the young child or adolescent more immune to future infections by increasing the natural resistance. The most expedient way to carry out the suggested program would of course be by a Federal Commission of Tuberculosis which I have ventured to suggest a number of times, but the need of which has been set forth recently and most convincingly by Lee K. Frankel, Ph.D., sixth vice-president of the Metropolitan Life Insurance Company,

in a paper entitled "A Plea for a Federal Commission on Tuberculosis." This paper was read before the Mississippi Valley Conference on Tuberculosis, September 30, 1915. This conference, as well as the South Atlantic, New England, and North Atlantic Tuberculosis Conferences, has unanimously adopted resolutions endorsing such a commission. The child of today is the man of tomorrow. If we wish to have a non-tuberculous race, a nation stronger physically, mentally, and morally than we have ever had before, the solution of the tuberculosis problem will bring us nearer this goal.

Appendix.

Since the above paper was sent to the American Journal of Public Health for publication, many other answers to letters of inquiries have come in and important events have transpired which made a revision with some changes and additions necessary and advisable in order to bring this contribution up to date. Among the events which happened was a remarkable address on The Control of Tuberculosis by Doctor Heiser at the Second Annual North Atlantic and New York State Conference on Tuberculosis which was held in Albany on November 4, 1915, and to which it was my privilege to listen.

Dr. Victor C. Heiser, formerly Chief Health Officer of the Philippine Islands, now the Director for the East of the International Health Commission of the Rockefeller Foundation, who had just returned from a visit to Australia, told us that in Victoria, Australia, tuberculosis was virtually stamped out and that this had been done by the simple method of having every tuberculous case reported and every individual afflicted with tuberculosis treated. If the authorities had convinced themselves that the patient did not constitute a center of infection in his home and had a reasonable chance of becoming cured (that is, if he had an outdoor sleeping porch and obeyed all prophylactic and curative measures) he was allowed to remain there. If, after investigation, the sanitary officers become convinced that a patient cannot be treated safely at home, he is compelled to enter an institution. If the patient is the bread winner of the family and of no means, and his sick and invalidity insurance is insufficient, the municipality assumes the responsibility of taking care of the family until the breadwinner is restored to his earning capacity. Children, when tuberculous, are being taken care of in the same way as the adults.

In our large congested American cities, as for example in New York, with our heterogeneous population, our social conditions and economic laws so vastly different from Australia, it may seem ludicrous to expect that anything like their method could be inaugurated. Yet I believe that by a united effort on the part of our statesmen to bring about insurance against disease, including tuberculosis, by the enforcement of antituberculosis laws and regulations in a strict but humane way such as is outlined in the above article, and lastly, by the aid of philanthropists to improve

the general housing and working conditions of the masses, the tuberculosis problem might be solved in the United States as well as in Australia, and in less time than might be thought possible. It needs a wise philanthropy, a just government, unselfish and enlightened statesmen, practical and expedient municipal laws, well-trained sanitarians and physicians, and an intelligent people to gain the victory over the great white plague.

The concluding sentence of Doctor Heiser's address may be well worth repeating here: "If it is possible for Australia to effectually combat tuberculosis, why should it not be possible for the United States to do so?"

The Metropolitan Life Insurance Company, which has already done so much toward educating the people in public health measures, and particularly in the prevention of tuberculosis, by its visiting nurses, by distributing educational leaflets to its policyholders and the public at large, and which has also shown its great interest in the cure of the tuberculous by establishing an ideal sanatorium at Mount MacGregor for its tuberculous employees, is evidently of the same opinion as Doctor Heiser. This great company is willing to give the method a trial, and has generously donated $100,000 so as to imitate the Australian experiment in the United States. This sum was offered officially to the National Association for the Study and Prevention of Tuberculosis at its Meeting in Washington, May 11 of this year, 1916, and gratefully accepted for the purpose designated by the directors of the Metropolitan Life Insurance Company.

It is planned to select a town or city of about 5,000 inhabitants, probably in New York or Massachusetts, and to apply there all of the knowledge on the treatment and prevention of tuberculosis available, with a view to the ultimate eradication of the disease. The following conditions will govern the selection of a city:

(1) The community must be one approximately 5,000 population.

(2) The composition of the population must be of a mixed character, racially, industrially, and socially.

(3) It should preferably not be a one-industry town, but should have several industries.

(4) The community must *welcome* the experiment and must promise cooperation of physicians, health boards, mayor, councils, and other civic, social, and industrial groups.

(5) It is the purpose of the experiment to attempt to show the community selected how, with proper direction, it can stamp out tuberculosis from its midst. To this end, the city or town should have access to certain agencies and institutions which can and will coöperate in the work. Such agencies as a county or city tuberculosis hospital, a tuberculosis clinic, open-air schools, visiting nurses, organized relief-giving agencies, etc., will be invaluable to the success of the community experiment.

The following are the resolutions which were adopted by the Association in accepting the $100,000 gift:

"The National Association for the Study and Prevention of Tuberculosis

expresses its hearty appreciation of the generous proposition of the Metropolitan Life Insurance Company to contribute $100,000 for conducting a community experiment in the control of tuberculosis. In undertaking this trust the Association hopes that the results of the experiment may be commensurate with the desires which inspired the offer."

PLAGUE.

It is a remarkable fact, confirmed by many observations, that many physicians who have devoted considerable labor to the study of a particular disease have themselves died of that disease. One of the most interesting examples is that of John Daniel Major, born August 16, 1634, in Breslau, a physician and naturalist of no mean ability. Bitten early by the wanderlust, he studied at Wittenburg, took courses at many of the schools in Germany, and finally went to Italy where he received the degree of doctor of medicine at Padua in 1660. Returning to his own country, he resided for a short time in Silesia, and in 1661 married at Wittenburg, Margaret Dorothy, a daughter of the celebrated Sennert. The following year, his young wife was stricken with plague and died after an illness of eight days. Distracted by his loss, Major wandered up and down Europe studying plague wherever he found it in the hope that he might discover a cure for the disease which had bereaved him. Spain, Germany, France and Russia were visited by him. He settled in 1665 in Kiel, where he was made professor of botany and the director of the botanical gardens. He made frequent voyages, however, always in quest of the remedy for plague. Finally in 1693, he was called to Stockholm to treat the queen of Charles the Eleventh, then ill with plague. But before he could render her any service, he contracted the disease and died on the third of August.

The bubonic plague of today is identical with the black death of the Middle Ages. Primarily a disease of rodents caused by a short dumb-bell shaped microscopic vegetable, the pest bacillus, it occurs in man in three forms; the pneumonic, which has a death-rate of almost 100 per cent.; the septicaemic, which is nearly as fatal, and the bubonic in which even with the most modern methods of treatment the mortality is about 50 per cent. It is a disease of commerce, spreading around the globe in the body of the ship-borne rat. It is estimated that every case of human plague costs the municipality in which it occurs at least $7,500. This does not take into account the enormous loss due to disastrous quarantines and the commercial paralysis which the fear of the disease so frequently produces.

The disease is now treated by a serum discovered through the genius of Yersin. This is used in much the same way as is diphtheria antitoxin.

Plague is transferred from the sick rodent to the well man by fleas. The sick rat has enormous numbers of plague bacilli in its blood. The blood is taken by the flea which, leaving the sick rat, seeks refuge and sustenance on the body of a human being to whom it transfers the infection.

Since plague is a disease of rodents and since it is carried from sick rodents to well men by rodent fleas, safety from the disease lies in the exclusion of rodents, not only exclusion from the habitation of man but also from the ports and cities of the world. Those who dwell in ratproof surroundings take no plague. Not only should man dwell in ratproof surroundings, but he should also live in ratfree surroundings. The day is past when the rodent served a useful purpose as the unpaid city scavenger. Rats will not come where there is no food for them. Municipal cleanliness may be regarded as a partial insurance against plague. The prayer that no plague come nigh our dwelling is best answered, however, by rat-proofing the habitations of man. Modern sanitary science has evolved a simple and efficient weapon against the pestilence which walketh in darkness and striketh at noonday, and the United States Public Health Service has put this knowledge into practical operation and thus speedily eradicated plague wherever it has appeared in the United States.

THE EFFICIENCY OF VENEREAL CLINICS.

SUGGESTED REMEDIES FOR PRESENT DEFECTS.

PHILIP S. PLATT,
Superintendent, Bureau of Public Health and Hygiene, New York Association for Improving the Condition of the Poor.

One million, two hundred and fifty thousand individuals were treated in one hundred and twenty-two clinics in New York City in 1913 for venereal disease, yet in most of these clinics one could not determine the results of such treatment. Mr. Platt in this paper criticizes the filing systems in general use in these clinics and suggests a remedy in the form of a cross indexing by diseases.

A FLEET of battleships once steamed forth to target practice. Throughout the day they fired fast and furiously. On the success of the gunners depended the great fleet's value as an offensive and defensive weapon. The results were anxiously awaited. At length the report was made: some hundreds of shells had been fired; some thousands of dollars worth of explosives had been expended. But of hits, there was no mention! No record of hits had been kept.

A similar story might be told of practically every clinic and dispensary in New York City. Although, according to the report of the State Board of Charities, a million and a quarter individuals were treated in 122 public and private dispensaries (or out-patient departments) in 1913, *with what results* they were treated, no one can say.

Consider that in these 122 dispensaries some 5,000 physicians are giving their valuable time, that a multitude of attendants, nurses, and clerks are employed, that the 3,000,000 odd prescriptions that were filled represent the expenditure of hundreds of thousands of dollars for medicine. Then reflect that, in all but a very few dispensaries, the only information that is requested by the boards of managers and furnished by the clinic chiefs and dispensary superintendents, is the number of persons treated, the number of treatments given and the number of prescriptions filled—information of no significance from the point of view of clinic efficiency. How long would such conditions be tolerated in a bank or a railroad? It is true that some patients may be incurable, others perhaps quite undesirable. But, unless a dispensary is blind to its social responsibility, it must regard each new patient not merely as an interesting or an uninteresting case, not merely as one of many awaiting treatment, but as a *liability* in its account with society—a liability which will remain unsettled until the patient has been returned to society, cured of his ail-

ment, or satisfactory explanation made of the failure to do so. Only with such an ideal can a dispensary rise to the great field, which as yet it imperfectly fills.

But how admit success or failure when there is no accurate knowledge of what has been done? That this lack of reliable data is a common condition in genito-urinary clinics as well as in other clinics may be clearly shown.

As a part of a coöperative program with the Society for Sanitary and Moral Prophylaxis, the American Social Hygiene Association, and the Associated Genito-Urinary Clinics, of the city of New York, the Bureau of Public Health and Hygiene of the New York Association for Improving the Condition of the Poor visited twenty-seven genito-urinary clinics. With one partial exception, it was unable to discover that such information as the percentage of gonorrheal patients cured, the percentage ceasing treatment improved, the percentage ceasing treatment unimproved, the number of visits per patient, the number of patients coming once and never returning, indeed, even the number of patients treated per month, had ever been recorded in any of these clinics. In some clinics the determination of such facts would have been an absolute impossibility, in many it might have been secured only after many weeks of labor and handling of some 50 to 100,000 irrelevant cards; in a few it could be determined comparatively simply.

The difficulty generally lay in the filing system. As a rule, a case-history card, filled out at the first visit and sent to the central file of the dispensary remains there in unbroken rest until the patient himself returns to claim it and put it in the physician's hands. If the patient at any time ceases to come, no one is the wiser. In such a filing system, by far the most common, is hidden alike the fruitful and the barren work of the clinic. The remedy is exceedingly simple. A cross-index by diseases would change a great sarcophagus of records into a vitally important, active file. In a mere handful of cards, representing the possible diagnoses of a dispensary, the filing number of every patient's history card would be found according to diagnosis. A clinic chief could then ask the dispensary registrar to send him his gonorrheal, or his scoliosis, or his adenoid cases for any desired period, and in a short time a complete analysis of his work could be had.

This is what we found through the generous coöperation of the chiefs of four genito-urinary clinics that stand well among the best, in our analyses of the gonorrheal patients during the course of a year: 8 per cent. of the patients were recorded *discharged* as *cured;* 17 per cent. ceased treatment of their own accord, *improved* in condition but *not* cured as determined by clinical signs and complement fixation tests; 75 per cent. *ceased treatment unimproved.* This is profoundly interesting. Only 8 per cent. cured, 17 per cent. improved but still probably carrying the infection, 75 per cent. unimproved. These 75 per cent. made 50 per cent. of the total visits to the clinic. What a surprising

amount of wasted effort on the part of the physician, wasted time on the part of the patient, wasted money and opportunity on the part of the clinic. But how many clinics, other than genito-urinary, know from a study of their records whether they can make a better showing?

How can this be? One explanation may be found by determining the number of visits actually made by each patient, or better, the percentage of patients making one, two, three, four, etc., visits. It appears that 28 per cent. made one visit; 11 per cent. two, 7 per cent. three, 6 per cent. four, or 52 per cent. less than five visits. Otherwise expressed, the middle or median man made between three and four visits. In the treatment of gonorrhea others more capable may decide how many visits are generally necessary before complete recovery, but surely very few patients are cured in less than five visits. It is significant that the middle or median man among those discharged as cured in these four clinics made between sixteen and twenty visits, the median man among those ceasing treatment improved, made between ten and fifteen, the median man among those ceasing treatment unimproved, made two visits.

Such a serious situation suggests a number of questions. Do they cease of their own free will? Or are they not encouraged to return? Would they return if made to see the necessity of so doing? Or do they come once simply to secure alleviation of the more distressing symptoms? Can a clinic afford to throw away half of its time? Or shall we say it is not being thrown away? Is the idea that people really want to be cured and will do their part, if given an opportunity, erroneous? Must we "social service" them in the highways and byways,—a sort of forced conscription for medical treatment?

These questions are raised to suggest that the return of patients is not necessarily a simple, automatic affair. And yet with the introduction of a simple postal card follow-up system at the Boston Dispensary no less than 50 per cent. of those not returning of their own accord responded to the first postal that was addressed to them. At the genito-urinary clinic, Brooklyn Hospital Dispensary, 62 per cent. have responded to postals by presenting themselves for further treatment, or by giving adequate excuse for not returning. With such results as an example, what valid excuse is there for a genito-urinary clinic allowing over half its gonorrheal patients to make less than five visits?

Until the clinic chiefs, the dispensary superintendents, the boards of governors know in numbers and percentages what the facts are, the stimulus to improve and the accurate knowledge of improvement will be lacking. Let the clinic books be balanced, as it were, monthly, quarterly or yearly. Much is being put in, how much is being got out? If the dispensary really has a social responsibility for doing the utmost for the man that seeks, however faint-heartedly, to be cured, let no stone be left unturned, or follow-up system left untried, to effect that cure. If the numbers are too great for effect-

ive work, let one hundred men be treated efficiently, rather than three hundred inefficiently.

The much-abused, and neglected, so-called, hospital annex—the dispensary—fairly bristles with problems, social, charitable, administrative, ethical, therapeutic, educational, economic, and financial, as the Associated Out-patients Clinics has well pointed out. No attempt is made in this paper to discuss these problems. Be it said, however, that following the successful example of Michael M. Davis of the pioneer Boston Dispensary and Doctor Thompson of the Brooklyn Dispensary, the Society for Sanitary and Moral Prophylaxis, with the coöperation of this Bureau and other organizations, has planned the establishment in New York City of a pay evening venereal disease clinic for men, with paid physicians, social service worker with follow-up system and strict clinic accounting—the whole experiment to be placed on a self-supporting basis.

Already the beneficial effect of our studies may be clearly seen in the venereal clinics where they were undertaken, while the improvement in physical standards of equipment has been recently urged by the Associated Genito-Urinary Clinics. But until the knowledge of existing conditions, and of results accomplished, becomes an essential part of the operation of a clinic, the efficiency of venereal clinics must necessarily be low. On the other hand, a simple cross-index by diseases will make it possible for such information to be readily available. A wide-awake clinic chief will never be satisfied with such conditions as he will find. To remedy them he will see the necessity of a follow-up system which will bring the patients back and when this is done a long step toward clinic efficiency will have been taken.

APPENDIX.

Analysis of Gonorrheal Patients
Treated at Four Genito-Urinary Clinics in New York.
Period—One Year.

	Discharged as cured.*	Ceased treat. improved.†	Ceased treat. unimproved.‡	Total.	Per cent.
No. of patients	67	146	641	854	100
Percentage	8	17	75	100	
No. visits	1,305	2,231	3,432	6,968	
Average number visits	19	15	5	8	
Median man visited	16–20	11–15	2	4	
Percentage total visits	19	32	49	100	
Percentage making 1–4 visits	0	11	66	52	
Percentage making 5–10 visits	22	28	18	20	
Percentage making 11 and over visits	78	61	16	28	

A patient was declared:

*Dismissed as cured—when his history card so stated. This was done when there was a complete absence of discharge after the beer test, the urine was repeatedly clear, and no gonococci could be found. A negative complement fixation was required in one and was optional in the remaining clinics.

†Ceased treatment improved—when his history card showed that improvement had been made at time of the last visit, as judged by absence of discharge (whether only temporarily or permanently was not known), improvement in urine, and a smear for gonococci, if taken, showing negative. In this group are undoubtedly some who on their next visit would have been declared cured, while it consists for the most part of those who, while improved so far as symptoms are concerned, are quite possibly still harboring the gonococci and are consequently a particular menace to society.

‡Ceased treatment unimproved—when his history showed practically all the original symptoms in an active condition.

A period of six months elapsed between the date of admittance of the last patient and the analysis of the year's record.

The Diagnostic Cross-Index of Dispensary Case Histories.

WHAT IT CONSISTS OF.

A drawer of cards like this with guides bearing any sub-classification desired:

Diagnosis: Gonorrhea, Ant. Doctor* Smith 1915

Sept. 14,421, 14,470, 14,501.....

Oct. _____

*Or clinic, where patient is treated by different doctors.

HOW IT IS MADE.

When the case history of a new patient is returned to the registrar by the clinic chief, the registrar enters on the proper diagnosis card simply the number of the case.

WHAT IT IS GOOD FOR.

The diagnostic cross-index will enable the dispensary and its clinic chiefs to answer any of these questions in a very short space of time, by reference to the card bearing the name of the disease in question. The case histories are thus made immediately accessible and the work of any clinic or the phenomena of any disease may be reviewed as frequently as desired. The large central file will prove a valuable, frequently-consulted source of available information, instead of a cemetery for case histories.

This very simple and inexpensive bit of medical bookkeeping will give an accurate gauge of the entire dispensary work and the results obtained. It makes the case histories far more readily accessible to the clinic chiefs than if filed in the clinics. It places in the doctor's hands at a few moments' notice his case histories of any disease.

THREE HUNDRED MILLION RED CROSS SEALS TO BE DISTRIBUTED.

Three hundred million Red Cross Christmas Seals are being printed in Cincinnati for the annual holiday campaign to be conducted under the joint auspices of the American Red Cross and The National Association for the Study and Prevention of Tuberculosis.

The campaign for the sale of Red Cross Seals this year will be larger than ever before. Although in 1915 the sale reached the record total of 80,000,000 seals, bringing in $800,000, it is expected that this year at least 100,000,000 seals or $1,000,000 worth will be sold. The sale will be organized from Alaska to the Canal Zone and from Hawaii to Porto Rico. Every state and territory in the United States will have seals on sale. New organizations will be working in a number of the western states, including Montana, Utah and Wyoming. Distribution of the seals is now under way.

The Red Cross Christmas Seal for 1916 was designed by Mr. T. M. Cleland of New York City. It shows a Santa Claus in red on a green background in the center panel with a pack on his back bearing a red cross. The lettering "A Merry Christmas" and "A Happy New Year" is carried vertically up and down the sides of the seal, while the date and the words "American Red Cross" are across the bottom of the seal. The poster effect given by this seal is very striking and makes an unusually handsome design.

INDUSTRIAL HYGIENE AND HEALTH INSURANCE.

JOHN B. ANDREWS,
Secretary American Association for Labor Legislation.

IT IS sometimes said that the progress of industry was greater in the first half of the nineteenth century than in all the preceding ages. But in the glory of this striking achievement the worker's physical well-being received but little attention. Foul air, dust, filth, inadequate lighting, excessive hours, the unceasing roar of the machines, and finally speed, were some of the conditions now recognized as injurious.

The bad effects of such unhygienic working conditions have been pretty well understood for a long time. The French government issued a decree relating to "établissements dangereux, insalubres et incommodes" as early as 1810; the British Parliament provided a commission to study conditions in factories in 1815. German inquiries followed, and in the United States such official investigations have extended over more than three quarters of a century.

The first fifty years of investigation led to few definite results. Then there came a period of humanitarism born of the dismal, degrading hopelessness of the workers. Out of this period came the first consequential efforts to improve factory sanitation through protective legislation. England had gradually built up a system of protective measures before France, in 1874, developed a labor code. In the United States the first law regarding safety and hygiene in factories was enacted in Massachusetts in 1877.

During the period of a generation which has elapsed since the passage of that first American law in Massachusetts most of the states in this country have enacted laws aiming directly at the wage-earner's health. In sixteen states within five years we have required that physicians report certain occupational diseases. These reports have served a useful purpose in calling attention to a few of the most easily recognized trade maladies such as poisoning from phosphorus and lead. But the most earnest advocates of occupational disease reporting know that not even the one-thousandth part of industrial diseases will be notified under that legislation alone.

In a score of states we have laws requiring the removal of harmful dusts and fumes. These laws, too, have done some good. But people of understanding know that such regulations are frequently disregarded. We have, moreover, in the labor departments of half-a-dozen states some medical inspection of factories. Under a properly organized system for the conservation of health these inspectors should be occupying positions of dignity and power.

It must be admitted that despite a large body of regulatory legislation, which has had a very great educational value during a preparatory period,

existing laws have not been successful to any extensive degree in promoting industrial hygiene. Nothing is more educational than legislation; but the well informed know that legislation and education to promote industrial hygiene have thus far failed to produce adequate results in this country because one essential element has been lacking. They have lacked the element of constant financial pressure upon the employer, which is the most effective factor in winning the coöperation of employers in health conservation.

"What the state needs in the forward movement of organized society," says Professor Commons, "is the cooperation of all kinds of specialists with all kinds of interests affected. What is needed is such an organization of the departments of government as will bring this about. Each profession of experts contributes its essential part, but each is only a part and is ineffective without the other parts. . . . The physician starts from the field of individual pathology; the sanitary engineer from that of physical surroundings, the sociologist from that of social environment. Each may be expert in his own field, but dogmatic, misleading or futile, when he ventures to dominate the others. Instead of giving orders, each should modestly coöperate; and it is the business of political science, of government and administration to work out the methods and machinery by which each shall do so."

Germany was the first country to work out the methods and machinery for the successful promotion of industrial hygiene. As early as 1883, after years of unsuccessful attempts through factory regulations and sporadic private initiative, Germany took the lead and enacted the first compulsory health insurance law.

This law gave rise to a system which is famous the world over and which is often referred to by friends and enemies of Germany alike as one of the main causes of Germany's remarkable industrial advance. In more recent years eight other countries have followed that early example.*

The German law makes insurance compulsory for all wage-earners and for those salaried workers whose annual income is not over $600. The worker pays a part of the premium, and the employer a part; in other countries the state also contributes a share. The amount of the premium varies from 1½ per cent. to 4½ per cent. of the wages. The minimum cash benefit is 50 per cent. of the wages for each lost working day, and is supplemented by medical aid, the generosity and thorough organization of which have won fame for the German system. There the patient is entitled not only to medical treatment and medicines, but also to such medical supplies as spectacles, trusses and artificial limbs. The physician is frequently allowed to prescribe at the fund's expense special articles of food when they are necessary to the patient. Furthermore the enormous insurance funds are used for the construction of hospitals, sanatoria, health resorts, and

*These countries, arranged in chronological order of their laws are: Austria-Hungary, Luxemberg, Norway, Servia, England, Roumania, Russia and Holland.

special rest homes especially intended for the prevention of permanent incapacity. Maintenance there is provided for those persons who have drawn all their sick benefit but are still unable to work. There are also information bureaus, home visiting, in some places inspection of houses for the purpose of detecting unsanitary conditions, as well as lectures on all phases of hygiene. Elaborate statistics facilitating the study of the problem are kept by the imperial insurance office. And, by the way, we cannot too often repeat that no country has ever yet had sickness statistics worthy of the name until it had health insurance.

"German insurance legislation," says Dr. Lee K. Frankel of the Metropolitan Life Insurance Company, "has been effective in producing a comprehensive industrial hygiene. . . . Our need in the United States is the cultivation of the principle of prevention as applied to sickness and invalidity, similar to the beginnings which have been made in insurance against fire and accident. Before this can be done, however, we must have a comprehensive scheme of insurance against the consequences of sickness and invalidity." *

We need not, however, go to foreign sources for practical illustrations of the results which can be secured through social insurance. During the past five years a revolution has swept over this country and now two-thirds of our fifty states and territories have developed a form of social insurance popularly known as workmen's compensation for industrial accidents. This revolution in the methods of dealing with the industrial accident problem was brought about by a campaign of education—growing out of efforts to secure *legislation*. The success of this revolutionary campaign in this country as elsewhere was based upon the realization that under the old system accidents were not being prevented and that the injured and their dependents were being thrust into poverty. Degradation and crime, the natural heirs of poverty, formed a social problem for which there was finally demanded a social remedy in the form of social insurance.

Notwithstanding some early defects, the ultimate success of the social insurance remedy in dealing with the *accident* problem is no longer questioned. It is only a matter of time when every state in the union will have adopted this method.

Previous to this workmen's compensation movement there were accident reporting laws, but our accident statistics as a whole were then aptly characterized as not worth the paper they were printed upon. Numerous states also had encouraged efforts for the safeguarding of dangerous machinery, but one public official qualified by practical experience now declares that more progress in accident prevention has been made in his state in one year under workmen's compensation than in any previous period of five years. This increased activity is due to the financial pressure upon employers to reduce their insurance premiums by installing safety devices which will improve their rating as insurance risks. Moreover, the same

*Industrial Insurance the Basis of Industrial Hygiene, 1912.

official declares that in his state ten times as many dollars are now automatically without litigation paid to the injured or their dependents, thus keeping them from falling below the poverty line. In a word, by the use of this insurance method, accidents are now reported *automatically*, and dangerous machinery is now being *safeguarded in earnest*, because those injured by accident are now being *compensated* for their disabilities. The insurance method, when rightly applied, furnishes a continuous economic pressure toward accident *prevention*. And prevention is the real problem.

The present situation with reference to *disease* is even worse than was the case with regard to accidents five years ago. Concerning health in the industrial world as a whole, the charge may justly be made, with but few qualifications, that the worker is still uninstructed of his danger, the employer is still ignorant or indifferent concerning preventive measures, and toward both conditions the public has been, until recently at least, profoundly apathetic. It is more difficult to dramatize the gradual lowering of vitality of half a million men than the accidental snuffing out of the lives of half a hundred.

The health of hundreds of thousands of working men and women is undermined today by conditions of employment which can be improved. British figures show that ill health is so general among the industrial population that 26 per cent. of the insured persons claimed sickness benefit during the first year's operation of the insurance act. Fully one-fourth of the sickness among industrial workers can be prevented. Conservative experts have estimated that the mere financial saving due to such prevention each year might easily total one-quarter of a billion dollars. The moral, intellectual and social possibilities of this reform are of course beyond computation.

That problem, however, can not be met by scattered individual efforts. It is a problem for organization on a scale as vast and far-reaching as industry itself. It calls for the coöperation of all groups in the community. It requires the daily exercised precautions of informed workers in factory, workshop and mine; it requires the constant alertness of employers; it requires the best energy and skill of a devoted medical profession; it requires, finally, the constant compelling force of the government in order that administration may be comprehensive, secure and effective.

What motive can we appeal to and what method can we use in a comprehensive movement toward industrial hygiene?

Would it not be interesting to try what health insurance can do toward securing systematic reports of illness, scientific prevention of ill health, and reasonable care of those suffering from sickness? In this way alone can we hope to command the necessary funds for scientific treatment or to secure that unceasing pressure for prevention.

A sentiment favorable to such preparedness already manifests itself in many quarters. The American Federation of Labor at its last two conventions has discussed this subject. The Ohio State Board of Health, after

a two years' survey of industrial hygiene, recently published an editorial favoring state insurance against sickness. The American Medical Association has just published a fifty-page report on social insurance. The chairman of an important committee of the conservative National Association of Manufacturers reported in this language last summer after a wide study of the subject:

"I give it as my opinion that sickness insurance of some kind, with compulsory contribution on the part of employers, will be enacted into law by many states of the Union within the next five years and that now is the time to go into this subject thoroughly."

Shall we not all agree that the time is fully ripe for persistent scientific application to this problem? Surely we must admit that a thorough campaign of education is needed. Experience with the accident problem has demonstrated that social insurance is the most effective educator. Is it not time for us to apply the method of social insurance, already revolutionary in its effects upon the problem of safety, to the solution of this greater question of health?

The problem of developing a compulsory health insurance system in America is of course a complicated one. The coöperation of many skilled and experienced people is needed. Legislative proposals ought to be carefully formulated and widely discussed. It was with this point of view that the Social Insurance Committee of the American Association for Labor Legislation began its work nearly three years ago. Over a year ago it formulated and widely distributed its tentative standards. As a result of much additional patient work and a continuing series of conferences, that committee is now ready to submit for wider discussion and criticism the draft of a health insurance bill. Doubtless many helpful suggestions will come from all interested groups, and it is expected that health insurance bills will soon be introduced in the legislatures of the principal industrial states.

THE REGISTRATION OF NON-RESIDENT DEATHS.

WM. H. DAVIS, M. D.,
Vital Statistician, Boston Health Department.

Read before the Vital Statistics Section of the American Public Health Association, Rochester, N. Y., September 9, 1915.

WHILE comparisons of the crude death-rates of different cities may be suggestive and so not devoid of all value, it is evident that refined or corrected death-rates permit much more accurate comparisons. Indeed the more the rates are corrected the more accurate become such comparisons.

Already the Census Bureau has published rates corrected for sex and age distribution, but if cities of the North and South are to be compared it is essential that the rates be corrected also for color.

Similarly for cities of the East and West, compared death-rates should be corrected for nationality, inasmuch as some nationalities are much more hardy than others; while to secure truly refined rates still further corrections for differences in occupations, in social conditions, etc., should be applied.

In a word, before the differences in our death-rates can be properly ascribed to differences in the climate and to differences in effectiveness of board of health work, like populations with like occupations must be given to the various cities to be compared.

While this extreme refinement of death-rates is hardly possible at present, there is no reason why some refinement cannot be attempted now, so that our death-rates may more nearly indicate the effectiveness of health work.

To that end, therefore, I wish to urge a uniform method of dealing with deaths of non-residents.

The need of a correction for such deaths is evident from the fact that the commuters of some cities dwell within the city limits while in others they dwell outside such limits.

This fact is shown by comparing the populations of our large cities with the populations of their respective metropolitan districts.

These population figures for Boston show that 56 per cent. of the residents of the metropolitan district dwell outside the city proper, against 49 per cent. for Pittsburg and at the other extreme 1 per cent and 2 per cent. respectively for Seattle and Indianapolis.

It is self-evident that the cities with the more populous suburbs will have daily a greater influx of non-residents to shop, to work, to seek hospital treatment and to die.

While these figures are very striking, they do not tell the whole story, for a place with a comparatively small suburban population may still be a hospital center for a large territory and so have many non-resident deaths.

Although the need of correcting

TABLE A.

ADAPTED FROM TABLE 25 ABSTRACT OF THE 1910 CENSUS.

Population of metropolitan districts. Cities of 200,000 or over.			Percentage of metropolitan population outside of the city proper.
New York	Metropolitan district	6,474,568	26
	In city proper	4,766,883	
	Outside	1,707,685	
Chicago	Metropolitan district	2,446,921	11
	In city proper	2,185,283	
	Outside	261,638	
Philadelphia	Metropolitan district	1,972,342	21
	In city proper	1,549,008	
	Outside	423,334	
Boston	Metropolitan district	1,520,470	56
	In city proper	670,585	
	Outside	849,885	
Pittsburg	Metropolitan district	1,042,855	49
	In city proper	533,905	
	Outside	508,950	
St. Louis	Metropolitan district	828,733	17
	In city proper	687,029	
	Outside	141,704	
San Francisco	Metropolitan district	686,873	39
	In city proper	416,912	
	Outside	269,961	
Baltimore	Metropolitan district	658,715	15
	In city proper	558,485	
	Outside	100,230	
Cleveland	Metropolitan district	613,270	9
	In city proper	560,663	
	Outside	52,607	
Cincinnati	Metropolitan district	563,804	36
	In city proper	363,591	
	Outside	200,213	
Minneapolis	Metropolitan district	526,256	43
	In city proper	301,408	
	Outside	224,848	
Detroit	Metropolitan district	500,982	7
	In city proper	465,766	
	Outside	35,216	
Buffalo	Metropolitan district	488,661	13
	In city proper	423,715	
	Outside	64,946	

TABLE A—*Concluded.*

Population of metropolitan districts. Cities of 200,000 or over.			Percentage of metropolitan population outside of the city proper.
Los Angeles	Metropolitan district	438,226	27
	In city proper	319,198	
	Outside	119,028	
Milwaukee	Metropolitan district	427,175	12
	In city proper	373,857	
	Outside	53,318	
Providence	Metropolitan district	395,972	43
	In city proper	224,326	
	Outside	171,646	
Washington	Metropolitan district	367,869	10
	In city proper	331,069	
	Outside	36,800	
New Orleans	Metropolitan district	348,109	3
	In city proper	339,075	
	Outside	9,034	
Kansas City, Mo.	Metropolitan district	340,446	27
	In city proper	248,381	
	Outside	92,065	
Louisville	Metropolitan district	286,158	22
	In city proper	223,928	
	Outside	62,230	
Rochester	Metropolitan district	248,512	12
	In city proper	218,149	
	Outside	30,363	
Seattle	Metropolitan district	239,269	1
	In city proper	237,194	
	Outside	2,075	
Indianapolis	Metropolitan district	237,783	2
	In city proper	233,650	
	Outside	4,133	
Denver	Metropolitan district	219,314	3
	In city proper	213,381	
	Outside	5,933	
Portland Ore.	Metropolitan district	215,048	4
	In city proper	207,214	
	Outside	7,834	

crude death-rates for deaths of non-residents is generally recognized, opinions differ as to how this should be done.

Confusion has arisen in the discussion of this subject because "non-resident deaths" has not been clearly defined. It has sometimes been used as synonymous with "transferable deaths" an expression used in England,

though it is easy to see that in an endeavor to determine a refined death-rate other deaths beside non-resident deaths would be transferable.

Again opinions differ as to what deaths should be considered non-resident. Some include only deaths of non-residents in hospitals, some include also deaths of transients at the homes of friends, in hotels, etc., and some include those who have not dwelt in the city at least six months or a year.

On the other hand some favor excluding from non-resident deaths, non-residents who die as a result of accidents received within the city.

Still all will agree that for the purposes of comparison it is essential that the expression—deaths of non-residents—have a uniform meaning.

Now inasmuch as a death-rate simply expresses the number of the population who have died, the term non-resident should mean exactly the same whether applied to deaths or to population.

But we know what non-resident means when applied to the population, the meaning is clearly given in the instructions to the census enumerators, the principal guide to residence being the place of habitual abode.

Therefore when we speak of non-resident deaths we should use the word in exactly the same sense.

Instructions to census enumerators on this subject in 1910 were principally as follows:

"The law provides that all persons shall be enumerated at their 'usual place of abode.' This means the place where they may be said to live or belong, or the place which is their home.

"As a rule the usual place of abode is the place where a person regularly sleeps.

"There will be a certain number of persons having their usual place of abode in your district who are absent at the time of the enumeration. Thus if a member of any family in your district is temporarily away from home on a visit, or on business, or traveling for pleasure, or attending school or college, or sick in a hospital, such absent person should be enumerated and included with the other members of the family. But a son or daughter permanently located elsewhere should not be included with the family.

"There will be, on the other hand, a certain number of persons present and perhaps lodging and sleeping in your district at the time of the enumeration who do not have their usual place of abode there. As a rule, therefore, you should not enumerate or include with the members of the family you are enumerating any of the following classes:

"Persons visiting with this family;

"Transient boarders or lodgers who have some other usual or permanent place of abode;

"Students or children living or boarding with this family in order to attend some school, college, or other educational institution in the locality, but not regarding the place as their home;

"Persons who take their meals with this family, but lodge or sleep elsewhere;

"Servants, apprentices, or other

persons employed by this family and working in the house or on the premises, but not sleeping there; or

"Any person who was formerly in this family, but has since become an inmate of an asylum, almshouse, home for the aged, reformatory, prison, or any other institution in which the inmates may remain for long periods of time.

"Servants, laborers, or other employees who live with the family and sleep in the same house or on the premises should be enumerated with the family.

"Boarders (that is, persons eating and sleeping at the same place) or lodgers should be enumerated at the place where they are rooming or lodging, if they are there permanently or for reasons of a permanent nature—for instance, if this is their usual place of abode while carrying on their regular occupation or business.

"But transient boarders or lodgers who have no permanent home or usual place of abode should be enumerated where they happen to be stopping at the time of the census. This applies in particular to the lodgers in cheap one-night lodging houses who, for the most part, represent a floating population, having no permanent homes.

"If there is a school, college, or other educational institution in your district which has students from outside your district you should enumerate only those students who have their homes or regular places of abode in your district.

"Most inmates of medical and surgical hospitals are there only for temporary treatment and have other regular places of abode. Therefore you should not report as a resident of the hospital any patient unless he claims to have no other usual place of abode from which he is likely to be reported.

"If there is within your district a prison, reformatory, or jail, an almshouse, an asylum or home (sometimes called hospital) for the insane, orphans, blind, deaf, incurable, or feeble-minded, a soldiers' home, a home for the aged, or any similar institution in which inmates usually remain for long periods of time, all the inmates of such an institution should be enumerated as of your district. It is to be specially noted that in the case of jails the prisoners should be there enumerated however short the term of sentence."

So that in any doubtful case the residence should be decided by the rules laid down for the census enumerators. A correction for non-resident deaths will then be a perfectly definite correction easy to understand, easy to apply and a big step forward—though it will not be a panacea for all the imperfections which enter into a crude death-rate, any more than is the correction for sex and age distribution.

Therefore as a simple solution to this vexing question the suggestion is made that all reports give, first, total deaths, second, deaths of residents (*i. e.*, non-residents deducted), and whenever possible a third number of deaths, *i. e.*, the corrected number of deaths after all transferable deaths have been transferred. Corresponding rates for each of these totals could then be given.

For example the following headings and footnotes could be used:

Total deaths (stillbirths excluded);
*Deaths of residents;
†Corrected number of deaths;
Crude death-rate;
‡Death-rate of residents;
§Corrected death-rate.

In obtaining the corrected number of deaths, some places would be able to add in deaths of residents which occurred in certain institutions outside the city while others might be able to add in also many others who died outside.

Again in some health resorts it would be possible to transfer deaths of transients who had contracted the disease elsewhere, or where the length of residence was less than the duration of the preferred cause of death.

Persons dying in jails, lunatic asylums and workhouses might be transferred to the towns where they formerly resided, though in such cases the population should be correspondingly diminished in computing the refined death-rates.

Deaths of illegitimate infants in infant asylums might be transferred to the home towns of the mothers, if known, and the population correspondingly decreased.

Non-residents deaths when the disease was evidently contracted within the city might be transferred to the city. However, if this is done it is only logical to transfer out of the city deaths of residents when the disease was contracted outside.

Deaths of non-residents from violence received within a city should also, according to some, be credited to the city, though I do not agree with this view. For going back to our large metropolitan districts with their great daily influx of non-residents, the greatly increased daily population will surely result in more accidents and more deaths than would occur without such an increase in the population. So that if these deaths from accidents to non-residents are to be charged up to the city in which they occur, then in some way the population should be increased by an estimate of the daily influx of non-residents. Such an estimate of increased population would certainly be difficult.

The simpler method, it seems to me, is to consider such deaths as we do other non-resident deaths.

Then the two totals side by side, total deaths from accident and deaths of residents from accident, will clearly show how many deaths of non-residents were due to accident.

Surely the mere citation of these various possible corrections for transferable deaths shows how complex the problem is; and inasmuch as it is not now practicable for all places to transfer all deaths in the same way, is it not best to leave this question of transferable deaths to be worked out as well as may be by each health officer, following so far as possible the admirable rules suggested in Doctor Wilbur's paper last year? If this plan

*Deaths of non-residents deducted from total deaths but deaths outside the city of residents not added.

†Corrected for transferable deaths, *i. e.*, deaths of non-residents deducted from total deaths, deaths of those who contracted the disease elsewhere deducted, deaths outside the city of residents added, etc. (stating definitely what deaths have been transferred).

‡Based upon deaths of residents within the city, no deaths outside the city of residents added.

§Based upon the corrected number of deaths, corrected for age and sex distribution, etc. (stating definitely all corrective factors applied).

is followed, I would emphasize the need of definitely stating in the footnotes just what deaths have been transferred whenever corrected figures are given.

Or perhaps it would be best at present for most cities to give only the crude figures, and the figures for residents, omitting entirely the column designated *corrected number of deaths*, leaving this more complex refinement to be worked out by state registrars and the Census Bureau.

To summarize briefly:

Non-resident deaths should be registered as such.

Alongside total deaths in reports should be given deaths of residents (*i. e.*, non-residents deducted) with corresponding rates.

The term non-resident should be used as in the enumeration of the census, and instructions to the enumerators should furnish the basis for determining the residence in each case.

Other transferable deaths may enter into a corrected total of deaths and a more refined death-rate, but should not befog the simpler question of deaths of non-residents.

WHAT YOU SHOULD KNOW ABOUT TUBERCULOSIS.

Free expert advice for consumptives and others interested in tuberculosis is given in a pamphlet just issued by the National Association for the Study and Prevention of Tuberculosis entitled "What You Should Know About Tuberculosis."

The pamphlet was prepared by a committee of experts of international prominence consisting of Dr. Charles L. Minor of Asheville; Dr. David R. Lyman of Wallingford, Conn.; Dr. H. R. M. Landis of Philadelphia; Dr. John H. Lowman of Cleveland, and William H. Baldwin of Washington. It contains the latest and most authoritative information about tuberculosis.

It deals with the nature of the disease; how infection may take place; how the disease is cured; how the family may be protected; what the patient may do after discharge, and how the disease may be prevented in the community.

A copy of the pamphlet will be sent free to anyone applying for it at the office of the Committee on the Prevention of Tuberculosis, State Charities Aid Association, 105 East 22d Street, New York, and large supplies of copies for local distribution may be had at cost from the Committee.

A CENSUS OF THE CONTAGIOUS DISEASES OF 8,786 CHILDREN.

E. C. Henderson, B. A.
Assistant in Vital Statistics, Institute of Public Health, London, Canada.

From data collected during the year 1912-1913 by H. W. Hill, M. B., M. D., D. P. H. Director.

THIS report on the contagious diseases of children (namely, chickenpox, diphtheria, German measles, measles, mumps, scarlet fever and whooping-cough), is a completion of a former partial report issued by the Institute of Public Health, London, Canada, and published in the American Journal of Public Health, September, 1913.

Primarily the aim of this census was to obtain more complete statistics of the above contagious diseases; secondarily, to test the method of collecting data here employed.

The Method of Collecting Data.

Cards were distributed, throughout the schools of the city, to be filled in by the mother (or guardian) for each

TABLE 1.

SHOWING THE NUMBER OF CHILDREN, AT EACH AGE, FOR WHICH A CARD WAS CORRECTLY FILLED IN.

Age.	Male.	Female.	Total.	
Under 1	78	72	150	
1	99	101	200	
2	124	117	241	
3	138	117	255	
4	196	198	394	Total under 5 = 1,240
5	271	256	527	
6	354	318	672	
7	356	339	695	
8	350	371	721	
9	344	352	696	
10	341	327	668	
11	306	291	597	
12	307	307	614	
13	283	297	580	Total (5–14) = 6,237
14	237	240	477	
15	197	170	367	
16	139	170	309	
17	100	133	233	
18	80	90	170	
19	59	85	144	
20	31	45	76	Total (15–20) = 1,309
Total.....	4,390	4,396	8,786	

school child, and also for those children at home below or above school age. The facts required concerning each child were:

1. The sex of the child.

2. The age of the child at the time of census.

3. Which of the above diseases the child had had and at what ages the attacks occurred.

The Returns.

The total number of cards returned was 8,993, of which 207 or 2.3 per cent. were rejected as improperly filled out leaving 8,786 satisfactory cards, representing children which were distributed by age and sex as in Table 1. (Of the rejected cards 117 were used for certain purposes in the report of 1913. These were, however, rejected in this report because the age at the time of attack was not given although it was stated that the child had had the disease.)

The number of Public School children (ages 5–14) for which a correctly filled in card was returned was 88 per cent. of the total attendance.

Table 2 gives the percentage, for each disease, of the children at each age who had already had an attack. It might be noted that the age of the child *at the time of the attack* is not necessary in the calculation of the results of this table, but only whether

TABLE 2.

SHOWING THE PERCENTAGE OF THE CHILDREN, AT EACH AGE, WHO HAD ALREADY SUFFERED AN ATTACK.

Age.	Chicken-pox.	Diph-theria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whooping-cough.	Total.
Under 1	.7	.0	.0	.0	.0	.0	6.0	6.7
1	8.0	.0	.0	4.0	1.0	.0	14.5	27.5
2	11.2	.8	1.2	10.4	4.8	.8	19.9	49.1
3	18.8	.8	3.1	22.0	5.1	3.9	25.9	82.6
4	22.1	1.5	2.0	33.7	11.1	5.1	38.6	112.1
5	27.3	1.7	4.4	35.5	9.4	5.3	42.7	128.3
6	32.6	2.1	6.3	49.7	17.3	5.9	55.7	169.6
7	40.4	2.4	4.7	60.3	23.0	11.5	58.0	200.3
8	39.8	3.1	8.4	71.2	27.7	12.2	59.6	222.0
9	46.0	5.7	9.9	79.5	38.1	10.0	60.8	250.0
10	49.2	6.4	9.3	79.3	39.8	15.4	65.3	264.7
11	49.9	7.7	12.9	80.4	50.9	18.2	63.2	283.2
12	50.8	10.9	12.7	82.9	50.9	21.7	64.0	293.9
13	51.9	11.6	15.2	85.0	57.1	23.6	64.7	309.1
14	57.0	11.7	15.3	82.6	49.7	26.0	60.6	302.9
15	52.3	13.9	13.1	84.2	52.5	26.7	60.0	302.7
16	53.1	14.7	17.2	82.2	54.4	28.5	61.8	311.9
17	55.8	13.3	15.0	83.3	53.2	26.2	62.2	309.0
18	51.2	17.6	12.9	81.8	45.9	24.7	54.7	288.8
19	58.3	16.7	20.1	84.0	60.4	30.6	63.2	333.3
20	47.4	17.0	17.0	82.1	51.3	28.9	51.3	295.0

or not the child had had the disease. Hence any error in misstating the age at which the attack was suffered would not influence these percentages.

In considering the results of Table 2 it may be well to remember that:

1. The number of cards returned for children at the extreme ages is comparatively small. This might cause the results at these ages to be slightly unreliable.

2. There probably was a tendency on the part of some mothers or guardians not to fill in a card at all unless the child had had one at least of the seven diseases. Any error thus introduced would be in the direction of increasing the percentage figures given in this table, over the truth. This tendency would be gradually eliminated in the case of older children, because of the fact that very few children at the older ages would be found who had not suffered from at least one of the seven infectious diseases dealt with.

3. In the case of older children there may have been a tendency to forget an attack, which would reduce the percentage figures given, below the truth.

It may, therefore, be that the results at the younger ages are indicated as larger than they should be; at the older ages, as smaller. (See also comments on Table 8.)

Table 3 (a) gives the number of females attacked by each disease, per 100 males attacked by the same disease for groups of children composed of 100 of each sex at each age from 6 to 14 inclusive.

Table 3 (a), showing the number of females who had already been attacked, per 100 males already attacked in a group of children consisting of 100 of each sex, at each age, from 6 to 14 inclusive:

In every case it is to be noticed that the female attack rate is larger than that of the male, the difference being comparatively small however.

Table 3 (b) gives the number of attacks, per head, already suffered from all seven infections, by the children of each school, each school being reduced to a standard namely:

A school, the attendance of which is composed of 100 children of each sex, at each age from 6 to 14 inclusive.

From this table it appears that the prevalence of the seven infectious diseases here treated is not affected to any great extent by the social conditions of the children.

Table 4 gives the percentage of certain groups of children attacked when at a certain age (*i. e.*, when in a certain year of life). The groups being composed of those children:

TABLE 3 (a).

SHOWING THE NUMBER OF FEMALES WHO HAD ALREADY BEEN ATTACKED, PER 100 MALES ALREADY ATTACKED IN A GROUP OF CHILDREN CONSISTING OF 100 OF EACH SEX, AT EACH AGE, FROM 6 TO 14 INCLUSIVE.

Chicken-pox.	Diphtheria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whooping-cough.	All.
106	114	116	102	101	111	105	105

TABLE 3 (b).

SHOWING THE NUMBER OF ATTACKS PER HEAD, FROM ALL SEVEN INFECTIONS, FOR THE DIFFERENT SCHOOLS.

School.	Number of attacks per head.
Aberdeen	2.5
Alexandra	2.6
Chesley Avenue	2.5
Colborne Street	2.8
Empress Avenue	2.2
Grand Avenue	2.5
King Street	2.5
Lorne Avenue	2.7
Princess Avenue	2.6
Quebec Street	2.7
Rectory Street	2.5
Richmond Street	2.6
Simcoe Street	2.5
St. George's	2.6
Talbot Street	2.5
Victoria Street	2.7
Wortley Road	2.5
Sacred Heart	2.6
St. Mary's and St. Martin's	2.2
St. Michael's	2.7
St. Peter's	2.2

(a) Who at time of the census had passed the year of life under consideration.

(b) Whose ages *at time of census* were 16–20 years.

(c) Whose ages *at time of census* were 11–15 years.

(d) Whose ages *at time of census* were 6–10 years.

The number of children in each group being:

(a) From 8,636 to 932.

(b) 932.

(c) 2,635.

(d) 3,452.

This table brings out certain fallacies due to the method of collecting data.

1. Assuming that the seven diseases of the table are not increasing in prevalence it appears that in the case of older children an attack is sometimes forgotten. This is most evident in cases of the milder and more prevalent infections, especially if some time has passed since the attack occurred, as is plain from the results for chickenpox, measles, mumps, whooping-cough, and the total.

For instance, in measles we notice that the figures for the first and second three year periods in column D are much larger than in column C; also those in column C are in turn larger than those in column B.

2. The age at the time of attack, especially in cases of older children, may be misstated, being given as higher than it really was. This may be the reason for the fact that while in the case of chickenpox and whooping-cough, the percentage attack for the first and second three year periods of life is much larger in group C than in B, it is larger for the third three year period in B than in C. Yet this result may be due to the number of forgotten attacks for this period being comparatively few in the case of children of group (B).

It is also to be noticed in the case of diphtheria and scarlet fever that the figures in column D are much smaller than the corresponding figures in column C. This leads to the conclusion that these two diseases are decreasing in prevalence.

TABLE 4

SHOWING THE PERCENTAGE OF CERTAIN GROUPS OF CHILDREN WHO SUFFERED AN ATTACK WHEN AT A CERTAIN AGE (i. e., WHEN IN A CERTAIN YEAR OF LIFE).

Age.	Chickenpox.				Diphtheria.				German measles.				Measles.			
	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	A.	B	C.	D.
Under 1	.9	.2	.7	1.1	.1	.1		.1	.2		.2	.1	1.4	.6	1.4	1.6
1	3.1	2.5	2.6	2.9	.4	.5	.3	.4	.6	.2	.8	.7	5.4	3.6	4.6	5.9
2	4.8	4.0	4.6	4.3	.6	.4	.8	.5	.7	.8	.8	.6	7.9	3.8	6.9	9.0
3	5.1	4.0	5.2	5.4	.8	1.0	1.4	.5	1.1	1.0	1.4	1.0	8.9	5.5	8.1	9.5
4	6.5	5.0	6.3	6.7	1.0	1.6	1.4	.8	1.2	1.6	1.2	1.1	9.8	7.3	8.4	11.5
5	6.6	5.7	6.9	6.6	1.1	1.6	1.7	.4	1.2	1.7	1.1	1.2	10.9	11.1	11.1	10.7
6	7.0	6.5	6.5		1.1	1.0	1.6		1.5	1.9	1.4		11.1	11.7	11.3	
7	5.7	5.8	5.2		1.9	1.5	1.0		1.4	1.4	1.2		9.5	7.6	9.3	
8	4.8	4.8	4.4		.6	1.1	.5		1.3	.8	1.6		8.1	8.0	8.2	
9	3.3	3.6	3.1		1.0	2.3	.7		1.2	1.2	1.2		5.3	4.3	5.9	
10	3.1	3.2	3.0		.8	1.1	.7		1.1	1.1	1.1		4.6	6.4	3.9	
11	1.9	1.7			.5	1.2			.9	.9			2.8	3.2		
12	2.2	2.6			.5	.5			1.2	1.3			2.5	3.2		
13	1.4	1.6			.2	.3			.5	.3			1.6	2.0		
14	1.2	1.2			.5	.5			1.1	1.2			1.3	1.5		
15	.4	.4			.1	.1			.4	.4			1.8	1.8		
i	8.8	6.7	7.9	8.3	1.1	1.0	1.1	1.0	1.5	1.0	1.8	1.4	14.7	8.2	12.9	16.5
ii	18.2	14.7	18.4	18.7	2.9	4.2	4.5	1.7	3.5	4.3	3.7	3.3	29.6	23.9	27.6	31.7
iii	17.5	17.1	16.1		2.6	3.6	3.1		4.2	4.1	4.2		28.7	27.3	28.8	
iv	8.3	8.5			2.3	4.6			3.2	3.2			12.7	13.9		
v	4.8	5.4			1.2	1.3			2.8	2.8			5.4	6.7		

	Mumps.				Scarlet fever.				Whooping-cough.				All diseases.			
1	.1	.1			.2		.4	.2	2.3	1.6	2.0	2.3	5.3	2.7	4.7	5.5
2	.8	.3	.4	.9	.8	.9	1.3	.5	6.2	4.4	5.4	6.7	17.3	12.5	15.4	18.1
3	1.9	1.8	1.2	2.1	1.4	1.0	2.2	.9	8.0	4.7	7.0	8.4	25.2	16.4	23.5	25.7
4	2.6	1.9	1.5	3.5	1.9	1.5	2.4	1.3	8.3	6.1	8.1	9.4	28.7	20.9	28.1	30.6
5	3.8	2.6	2.8	4.8	2.2	3.1	3.1	1.5	8.7	6.7	9.2	9.5	33.1	27.9	32.3	36.0
6	5.2	4.2	5.1	5.4	2.6	2.9	3.0	2.2	8.3	7.4	8.1	8.7	35.8	34.6	37.1	35.3
7	5.7	4.4	6.9		1.9	2.9	1.7		6.9	7.5	6.6		35.1	35.9	36.0	
8	6.1	4.3	7.8		2.3	3.4	1.9		5.5	4.4	5.4		31.4	28.4	31.8	
9	6.5	4.0	7.1		2.1	2.6	1.8		3.8	4.7	3.9		27.2	26.0	26.6	
10	5.5	2.5	6.4		1.9	2.7	1.7		2.7	2.8	2.9		20.9	19.3	21.8	
11	5.5	4.0	6.1		1.5	2.3	1.3		2.4	3.8	1.9		19.0	21.8	18.0	
12	3.5	4.9			1.0	1.0			1.2	1.9			11.9	14.8		
13	4.6	5.4			1.1	.8			1.2	2.2			13.4	16.0		
14	3.2	3.3			.7	.5			.6	.8			8.1	8.9		
15	3.2	3.4			1.1	1.2			.2	.2			8.5	9.2		
16	2.6	2.6			.6	.6			.3	.3			6.2	6.2		
i	2.8	2.2	1.6	3.0	2.4	1.9	3.9	1.6	16.5	10.7	14.4	17.4	47.8	31.6	43.6	49.3
ii	11.6	8.7	9.4	13.7	6.7	7.5	8.5	5.0	25.3	20.2	25.4	27.6	97.6	83.4	97.5	101.9
iii	18.3	12.7	21.8		6.3	8.9	5.4		16.2	16.6	15.9		93.7	90.3	95.4	
iv	14.5	11.4			4.4	6.0			6.3	8.5			51.8	55.9		
v	11.0	12.1			2.9	2.5			2.0	3.2			30.0	34.1		

i, under 3; ii, 3 to 5; iii, 6 to 8; iv, 10 to 12; v, 13 to 15.

Table 5 gives the percentage of the children already attacked on reaching a certain age (*i. e.*, on reaching a certain birthday). The results here given are obtained simply by a successive summation of the results of Table 4.

As already noted the figures of Table 4 do not represent the true percentage of the children attacked when at a certain age. This is due to facts already mentioned in connection with that table.

Table 6 is therefore given. It is identical in form with Table 4 differing only in the figures of the different columns. The percentage of the children attacked when at a certain age, in this table, is believed to be more

TABLE 5.

SHOWING THE PERCENTAGE OF CERTAIN GROUPS OF CHILDREN WHO HAD ALREADY SUFFERED AN ATTACK, ON REACHING A CERTAIN AGE (*i. e.*, ON REACHING A CERTAIN BIRTHDAY).

Age	Chickenpox.				Diphtheria.				German measles.				Measles.			
	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.
1	.9	.2	.7	1.0	.1	.1	.0	.1	.2	.0	.2	.1	1.4	.6	1.4	1.6
2	4.1	2.8	3.3	4.0	.5	.6	.3	.5	.8	.2	1.0	.8	6.8	4.3	6.0	7.6
3	8.9	6.7	7.9	8.3	1.1	1.1	1.2	1.0	1.6	1.0	1.8	1.4	14.6	8.0	12.9	16.6
4	14.0	10.6	13.2	13.7	1.9	2.0	2.6	1.5	2.7	1.9	3.2	2.4	23.5	13.5	21.0	26.1
5	20.5	15.7	19.4	20.4	3.0	3.7	4.0	2.2	3.9	3.5	4.3	3.5	33.2	20.8	29.3	37.6
6	27.1	21.3	26.3	27.0	4.0	5.3	5.8	2.6	5.1	5.3	5.5	4.8	44.1	31.9	40.4	48.8
7	34.1	28.0	32.8		5.1	6.2	7.3		6.6	7.2	6.9		55.2	43.6	51.8	
8	40.0	33.7	38.0		6.0	7.7	8.3		7.9	8.6	8.1		64.7	51.2	61.1	
9	44.6	38.5	42.4		6.7	8.8	8.8		9.3	9.4	9.7		72.8	59.2	69.3	
10	47.9	42.2	45.5		7.7	11.1	9.5		10.4	10.5	10.9		78.1	63.5	75.1	
11	51.0	45.4	48.5		8.5	12.1	10.2		11.5	11.6	12.0		82.7	70.0	79.0	
12	52.9	47.2			9.0				12.5	12.5			85.5	73.2		
13	55.0	49.7			9.6				13.7	13.8			87.9	76.4		
14	56.4	51.3			9.8				14.1	14.1			89.6	78.4		
15	57.5	52.5			10.2				15.2	15.2			90.9	80.0		
16	58.0	52.9			10.4				15.7	15.7			92.7	81.8		

Age	Mumps.				Scarlet fever.				Whooping-cough.				All.			
	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.
1	.1	.1	.0	.0	.2	.0	.4	.2	2.3	1.6	2.0	2.3	5.3	2.7	4.7	5.5
2	.9	.4	.5	.9	1.0	.9	1.7	.7	8.5	6.0	7.4	9.0	22.6	15.1	20.2	23.5
3	2.8	2.2	1.7	3.0	2.4	1.8	3.9	1.7	16.5	10.7	14.3	17.4	47.8	31.6	43.7	49.2
4	5.4	4.2	3.2	6.5	4.3	3.3	6.3	2.9	24.8	16.9	22.4	26.8	76.5	52.4	71.8	79.8
5	9.2	6.8	6.1	11.3	6.5	6.5	9.3	4.4	33.4	23.5	31.6	36.3	109.6	80.4	104.1	115.8
6	14.3	11.0	11.2	16.8	9.1	9.4	12.4	6.6	41.7	30.9	39.7	45.0	145.4	114.9	141.2	151.0
7	20.0	15.4	18.0		11.0	12.3	14.1		48.6	38.4	46.3		180.5	150.9	177.3	
8	26.1	19.6	25.9		13.3	15.7	16.0		54.1	42.8	51.8		212.0	179.3	209.0	
9	32.6	23.6	33.0		15.4	18.3	17.8		57.8	47.6	55.7		239.8	205.3	236.6	
10	38.1	26.1	39.3		17.3	20.9	19.4		60.5	50.4	58.6		260.0	224.6	258.5	
11	43.6	30.1	45.4		18.8	23.2	20.7		62.9	54.1	60.5		279.0	246.3	276.5	
12	47.2	35.0			19.8	24.2			64.1	56.1			291.0	261.1		
13	51.8	40.4			21.0	24.9			65.4	58.3			304.3	277.1		
14	54.9	43.7			21.7	25.4			66.0	59.1			312.4	286.1		
15	58.1	47.1			22.8	26.6			66.1	59.3			320.9	295.3		
16	60.7	49.7			23.3	27.2			66.4	59.6			327.1	301.5		

TABLE 6.

SHOWING THE ESTIMATED PERCENTAGE OF CHILDREN WHO SUFFERED AN ATTACK WHEN AT A CERTAIN AGE (*i. e.* WHEN IN A CERTAIN YEAR OF LIFE).

Age.	Chicken-pox.	Diph-theria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whooping-cough.	Total.
Under 1	1.1	.1	.2	1.6	.1	.2	2.2	5.5
1	2.9	.4	.6	5.8	.8	.9	6.2	17.6
2	4.3	.6	.7	8.0	2.1	1.4	8.0	25.1
3	5.4	.9	1.1	9.6	3.4	2.0	9.0	31.4
4	6.2	1.1	1.2	10.6	4.5	2.5	9.5	35.6
5	6.7	1.2	1.3	11.0	5.4	2.5	8.7	36.8
6	6.7	1.2	1.5	11.2	6.2	2.5	7.0	36.3
7	5.5	1.2	1.4	9.3	7.0	2.5	5.4	32.3
8	4.5	1.1	1.2	7.6	7.1	2.3	4.0	27.8
9	3.6	1.0	1.1	5.9	6.4	2.0	2.8	22.8
10	2.9	.9	1.0	4.3	5.5	1.7	2.0	18.3
11	2.3	.8	.9	3.1	4.8	1.4	1.4	14.7
12	1.8	.7	.8	2.4	4.0	1.1	1.0	11.8
13	1.3	.6	.7	1.8	3.3	.9	.6	9.1
14	.9	.5	.6	1.3	2.9	.7	.4	7.2
15	.5	.4	.5	1.0	2.6	.6	.2	5.7

representative of the truth, because the figures of Table 4 for the younger age groups (*i. e.*, the most reliable figures) were selected as far as possible. These were then graded so as to increase to a maximum, and then to decrease, as the age (*i. e.*, the year of life) increases.

With the exception of diphtheria and scarlet fever, for which diseases there is evidence of a decrease in prevalence (See Table 4), the figures of this table should represent present conditions. (See Table 9.)

Table 7 is obtained simply by a successive summation of the figures of Table 6. It gives the percentage of the children already attacked on reaching a certain age (*i. e.*, a certain birthday).

This table is identical with Table 5 except that the percentages should be more representative of the truth.

Table 8 gives the percentage of the children of a certain age who have already suffered an attack, deduced from Table 7 as follows:

The children of a certain age (say 5) have lived $5\frac{1}{2}$ years on the average. Therefore the percentage of these who have already suffered an attack would be the mean value for those who have lived exactly 5 and 6 years respectively, as given in Table 7.

This table is identical with Table 2 except that the values should be more representative of the truth, because of the fact that the results of this table were obtained by considering the cases of:

TABLE 7.

SHOWING THE ESTIMATED PERCENTAGE OF CHILDREN WHO HAVE ALREADY SUFFERED AN ATTACK ON REACHING A CERTAIN AGE (*i. e.* ON REACHING A CERTAIN BIRTHDAY).

Age.	Chicken-pox.	Diph-theria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whooping-cough.	Total.
1	1.1	.1	.2	1.6	.1	.2	2.2	5.5
2	4.0	.5	.8	7.4	.9	1.1	8.4	23.1
3	8.3	1.1	1.5	15.4	3.0	2.5	16.4	48.2
4	13.7	2.0	2.6	25.0	6.4	4.5	25.4	79.6
5	19.9	3.1	3.8	35.6	10.9	7.0	34.9	115.2
6	26.6	4.3	5.1	46.6	16.3	9.5	43.6	152.0
7	33.3	5.5	6.6	57.8	22.5	12.0	50.6	188.3
8	38.8	6.7	8.0	67.1	29.5	14.5	56.0	220.6
9	43.3	7.8	9.2	74.7	36.6	16.8	60.0	248.4
10	46.9	8.8	10.3	80.6	43.0	18.8	62.8	271.2
11	49.8	9.7	11.3	84.9	48.5	20.5	64.8	289.5
12	52.1	10.5	12.2	88.0	53.3	21.9	66.2	304.2
13	53.9	11.2	13.0	90.4	57.3	23.0	67.2	316.0
14	55.2	11.8	13.7	92.2	60.6	23.9	67.8	325.1
15	56.1	12.3	14.3	93.5	63.5	24.6	68.2	332.3
16	56.6	12.7	14.8	94.5	66.1	25.2	68.4	338.0

(a) Children over 5 years of age, thus tending to eliminate the effects due to the tendency, previously noted, to fill in cards only in case of the child having at least one of the infections (*i. e.*, the effect increasing the percentages at the younger ages over the truth).

(b) The youngest possible group of children, above 5 years, tending to eliminate the effect due to the tendency of an attack being forgotten when some time has elapsed (*i. e.*, the effect decreasing the percentages at the older ages below the truth).

Comparing the results of this table with those of Table 2 it might be noted, especially in the percentage attack from all seven infections, that:

(a) At the *younger ages* the figures are *smaller* than the corresponding ones of Table 2.

(b) At the *older ages* the figures are *larger* than the corresponding ones of Table 2.

This is as might be expected in view of the comments on Table 2. In other words we have proof of the two fallacies of the method of collecting data in this census.

(a) In case of the *younger* children cards were often not returned for children who had not had an attack from any of the infections.

(b) In case of the *older* children an attack of one or more of the infections was sometimes forgotten.

Table 9 gives the estimated annual number of cases occurring in the children *under 16 years*, for five consecu-

TABLE 8.

SHOWING THE ESTIMATED PERCENTAGE OF CHILDREN OF A CERTAIN AGE, WHO HAVE ALREADY SUFFERED AN ATTACK.

Age.	Chicken pox.	Diphtheria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whooping-cough.	Total.
Under 1	.6	.1	.1	.8	.1	.1	1.1	2.9
1- 2	2.6	.3	.5	4.5	.5	.7	5.3	14.4
2- 3	6.2	.8	1.2	11.4	2.0	1.8	12.4	35.8
3- 4	11.0	1.6	2.1	20.2	4.7	3.5	20.9	64.0
4- 5	16.8	2.6	3.2	30.3	8.7	5.8	30.2	97.6
5- 6	23.3	3.7	4.5	41.1	13.6	8.3	39.3	133.8
6- 7	30.0	4.9	5.9	52.2	19.4	10.8	47.1	170.3
7- 8	36.1	6.1	7.3	62.5	26.0	13.3	53.3	204.6
8- 9	41.1	7.3	8.6	70.9	33.2	15.7	58.0	234.8
9-10	45.1	8.3	9.8	77.7	39.8	17.8	61.4	259.9
10-11	48.4	9.3	10.8	82.8	45.8	19.7	63.8	280.6
11-12	51.0	10.2	11.8	86.6	50.9	21.2	65.5	297.1
12-13	53.0	10.9	12.6	89.2	55.3	22.5	66.7	310.2
13-14	54.6	11.5	13.4	91.3	59.0	23.5	67.5	320.8
14-15	55.7	12.1	14.0	92.9	62.1	24.3	68.0	329.1
15-16	56.4	12.5	14.5	94.0	64.8	24.9	68.3	335.4

tive years, per *a total population of 10,000*. (The distribution of population used was that as given by the Dominion Census of 1911, for London, Canada.)

With the average number of cases for the years given is compared the probable number of cases, per year, in the same group of children. This is deduced from the percentage of children attacked when at a certain age (Table 6) as follows;

The figures for the first and second year of life, given in Table 6, represent the probable number of children who will be attacked in the next year of life out of the two groups of children, 100 just born and 100 just one year old respectively.

In any population the children under one will have lived one half year on the average, those between one and two, one and a half years. Hence the problem resolves into finding the probable number of cases, per year, in the case of a group of children whose ages are (at the first of the year) $\frac{1}{2}$ year, $1\frac{1}{2}$ years, etc., the distribution of population by age being as used above.

Therefore the probable number of attacks per year for 100 children *aged one* as returned, is approximately the probable number for 100 children aged *one and one half exactly* which, in turn, is the mean value between the percentage of children attacked when under one year of age, and when one year of age as given in Table 6. These mean values were used in deducing the results of this table.

(This Table is representative of London, Canada.)

TABLE 9.

SHOWING THE ESTIMATED NUMBER OF CASES FOR LONDON OCCURRING IN THE POPULATION UNDER 16 YEARS, PER A TOTAL POPULATION OF 10,000.

Year.	Chicken-pox.	Diph-theria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whoop-ing-cough.	Total.
1907	96	14	22	199	148	22	125	626
1908	92	9	26	158	146	20	128	579
1909	93	12	21	133	97	28	124	508
1910	103	15	28	154	81	40	131	552
1911	119	9	31	154	95	37	99	544
Average	101	12	26	160	113	29	121	*562
Probable No. of cases per 10,000 population per year	95	22	26	161	111	42	117	574

It will be noticed that the probable number of cases per year agrees very closely with the average number for the five different years, for all the infections except diphtheria and scarlet fever. This exception can be easily explained by a previous conclusion, namely, that these two diseases are decreasing in prevalence.

The above results lead to the estimate of probably 2,800 to 2,900 cases, occurring in the population *under 16*, from all seven infections, per 50,000 total population.

In the report of 1913 the estimate of the number was 3,700, for the same population. This difference can be explained as follows:

1. The estimate of 1913 includes that for *pneumonia* as well as for the seven infections treated in the present report.

2. The estimate of 1913 was for the population *under 21*, while in the present report it is for the population *under 16*.

3. The estimate of 1913 was for a population in which the numbers of children in each age group were in standard proportion, while the numbers at each age of a group were not. The proportion of the children at ages where the chances of attack are lowest was lower than the proportion in a standard population, while at the ages where the chances were highest it was higher.

These three facts would all tend to make the estimate of 1913 higher than that of the present report.

Table 10 gives a comparison between:

(a) The estimated average number of cases occurring, per year, among the children *under 16 years* of a total population of 58,000 (the present estimated population of London) and (b) the actual number of cases reported in the year 1915 for London.

NOTE—The estimated number is obtained simply by multiplying the probable number as given in Table 9 by 5.8.

TABLE 10.

SHOWING (A) THE ESTIMATED PROBABLE NUMBER OF CASES THAT OCCURRED IN LONDON FOR THE YEAR 1915, (B) THE ACTUAL NUMBER OF CASES REPORTED IN LONDON FOR THE YEAR 1915.

	Chicken-pox.	Diphtheria.	German measles.	Measles.	Mumps.	Scarlet fever.	Whooping-cough.	Total.
A.....	551	128	151	934	644	244	679	3,331
B.....	65	151	0	80	24	38	8	366

TABLE 11.

SHOWING (A) THE MORTALITY RATE BASED ON THE REPORTED CASES, (B) THE PROBABLE ACTUAL RATE.

	Measles.	Scarlet fever.	Whooping-cough.
Rate based on reported cases.....	3.8%	5.3%	12.5%
Rate based on estimated actual cases.....	.3%	.9%	.2%

It will be noticed that, according to this table, diphtheria is the only infection treated in the table, for which the reported cases represent the actual number in existence.

The absolute worthlessness of the statistics as obtained from the cases as reported in London is demonstrated when we consider Table 11.

This table compares the case-mortality rate based on the reported number of cases with that based on the estimated actual number.

Summary.

The chief fallacies of this census method as brought out by this report are:

(a) In cases of the younger children a card was sometimes not returned for children who had not had an attack of at least one of the seven infections.

(b) In cases of the older children an attack was sometimes forgotten.

These two fallacies might be eliminated by:

(a) Confining the census to a certain group of children, such as the school children only. It might then be possible to receive returns from all.

(b) Confining the census to a limited period of time, for instance, requiring only whether the child had had an attack in the five preceding years, and if so, the age, etc., at time of such attack. This might tend to eliminate the forgetting of attacks.

While it is admitted that this census method of collecting morbidity statistics may show many fallacies, it is an improvement over methods already in use in that it gives more complete statistics, especially of the milder contagious diseases.

Special thanks are due to the Public and Separate School Boards, to Mr. C. B. Edwards, Inspector of Public Schools, and to the principals and teachers of all the schools, for their coöperation in collecting the data necessary for this investigation.

THE RELATION OF THE HOSPITAL AND DISPENSARY TO OCCUPATIONAL DISEASES.

W. Gilman Thompson, M. D.,
Professor of Medicine in the Cornell University Medical College in New York City.

Read before the Vital Statistics Section, American Public Health Association, September 8, 1915.

IN THE present state of knowledge of the occupational diseases in this country, the natural sequence under the title of this paper comprises:

(1) The encouragement of the physician to recognize and fully report cases of occupational diseases.

(2) The encouragement of hospital and dispensary authorities to adopt a uniform detailed nomenclature of the occupations of patients admitted to these institutions, and to issue to them circulars of information.

(3) The establishment of special occupational diseases dispensary clinics.

(4) The establishment of hospitals equipped for the detailed study and the treatment of the occupational diseases.

(5) Provision for the publication of the results observed or obtained.

(1) The education of the physician in the occupational diseases should begin with the training of the medical student, and no student should be allowed to present a case at clinic without full knowledge of the details of the patient's occupation, and the menace to health, if any, which it involves. For the physician the "reporting laws" now existing in more than a dozen states serve to direct attention to a subject almost completely neglected in this country until within a very few years past. These laws, at present covering scarcely more than a half dozen occupational diseases, should be expanded as they have been in England, to include at least thirty such diseases. The state, furthermore, can do much educational work by furnishing printed information in compact form for all physicians, but especially for those interested in hospital and dispensary work. This can best be done through the state labor bureaus or health boards. I believe that the State of New York Bureau of Labor took the initial step in this matter. A Committee on Occupational Diseases, which I organized a few years ago in New York City, coöperated with Mr. Leonard W. Hatch of the State Bureau of Labor in the preparation of a small booklet, comprising a tabulated list of the more important industrial diseases, with their chief symptoms and the various poisons causing them. The list is incomplete in that it does not tabulate the dusty trades, and should be expanded to include them, with other occupational hazards, but in so far as it extends it has been copied already by several other states.

A further step has subsequently been taken by Dr. David Edsall for the Massachusetts General Hospital by publishing a similar list in placard form to be hung on the walls where physicians in hospital and dispensary attendance may have ready access to it.

This list, with certain modifications, has been adopted by the Associated Out-patient Clinics of the City of New York for general distribution. It is to be supplemented by a placard tabulating the more important dusty trades and certain other occupations, including, for example, the hazards of working in a deleterious environment, as in excessive temperature, humidity, light, noise, etc., and should include a list of occupational postural deformities. Thus equipped, the dispensary physician should soon learn to recognize the occupational diseases with a thoroughness now sadly neglected.

(2) The dispensary and hospital authorities should furnish special history blanks for the accurate recording of the histories of all occupational diseases. Such blanks may be issued in comprehensive groups, as for instance, one to cover the diseases due to metal poisons, another the respiratory diseases due to dust inhalation, etc. Such blanks (copies of which are herewith submitted), I have had in use in my Cornell Medical Clinic for several years and they have proved invaluable as an aid to diagnosis. To make such blanks of maximum value, however, two things are essential. First, by coöperation, they should be made as nearly uniform as possible in different institutions, and second, a uniform standard nomenclature of occupations and the detailed industry under each occupation should be adopted. This, however, owing to the modern subdivisions of labor and the great diversity of occupations, is an exceedingly complex problem. The Bureau of the United States Census has this matter under present study, and whatever standards it ultimately establishes should be universally adopted by hospitals and dispensaries, for in this way only can reliable morbidity data be obtained on a sufficient scale to justify whatever legislative control of many hazardous occupations may prove desirable. At the present time, if one collect at random the annual statistical reports of any half-dozen metropolitan hospitals and dispensaries, it may be possible to determine how many Hungarians were treated, or how many Roman Catholics or Lutherans, or how many John Smiths, or possibly how many hatters; but how many of the hatters worked as "pouncers" and acquired chronic mercury poisoning in consequence, no one could possibly learn from the published reports, and yet that may be the sole reason why such a victim sought hospital or dispensary relief! A more absurd waste of energy than the average hospital statistical report could scarcely be devised!

A further important function of the hospital, and particularly the dispensary, consists in furnishing the patient afflicted by an occupational disease with a printed circular of information as to how to take care of himself and how best to avoid the hazards of his

occupation in future. That patients appreciate such information I have had ample proof in my clinic where it is distributed. [A sample circular on lead poisoning and one on cardiac diseases was here presented.] Patients not only study these leaflets themselves, but pass them to their fellow-workmen, and return to ask for more.

(3) The establishment of occupational diseases, dispensary clinics in the larger cities, or wherever hazardous trades are being conducted upon a large scale, is most desirable. During the present year the first definite clinic of this type in New York City has been opened by the Health Department and has already demonstrated its usefulness. The advantage of such a clinic is that it focuses attention upon a most important group of diseases. The physicians in attendance become trained in matters of etiology and diagnosis which might otherwise be overlooked, and the patients learn to seek relief for symptoms which perhaps they had not previously associated with their occupation, and bring their fellow-workmen for examination. Such a dispensary, moreover, affords a field for intensive study and investigation destined to become of far-reaching benefit. It may not be necessary to establish a separate dispensary in many places, but it is easy for any large general dispensary to organize an occupational diseases class, with physicians in attendance who are particularly interested and trained in the work. The equipment of any such class or complete dispensary should include ample laboratory facilities for work in clinical pathology and clinical chemistry, otherwise much important work in diagnosis cannot be undertaken.

(4) It is still a problem how far it is necessary to go in the establishment of occupational diseases hospitals, and it is possible that for some time to come the specialized dispensaries may fulfill the needs of the situation. The occupational diseases, with one or two exceptions, like the caisson disease, differ only epiologically, and in no wise pathologically from the same diseases as met with apart from conditions of labor or manufacture. The fibroid phthisis of the emery grinder does not differ from that of the octogenarian, nor is the chronic bronchitis of the furrier essentially different from that acquired in many other ways. The caries of "phossy jaw" in the matchmaker differs mainly in extent and severity from caries otherwise acquired and presents no new pathological phenomena. Moreover, the treatment of the occupational diseases is practically identical with that of similar diseases originating from many causes. The essential things are the early recognition of occupational diseases symptoms, the appreciation of their etiology and of the means of prophylaxis. It is therefore quite possible to treat the occupational diseases adequately in any general hospital, although for the sake of intensive study it may be appropriate to set aside one or two wards for the grouping of such cases. What really is needed is not mere hospitals for these diseases, but complete path-

ological institutes in which all the etiological and pathological factors may be studied thoroughly both experimentally and clinically. Such research work is much wanted, for example, to determine the effects of inhalation of nitrous fumes in the manufacture of high explosives, the depth to which various noxious dusts actually penetrate into the lungs, etc. The general hospital, moreover, is not usually equipped with adequate facilities for the treatment and study of many occupational diseases which come under the head of the "specialties," as, for instance, the effects upon the eye of electric flashes, as in electric arc welding, the many postural deformities, dental lesions, cutaneous lesions and neuroses due to occupation. More accurate study of the blood and urine in many cases of poisoning by toxic metals, gases, vapors and fumes demands elaborate laboratory equipment and trained investigators rarely to be found in the general hospital of the type at present existent in this country. There can be no question of the value to the community as an economic investment of a few first class institutes of the type above outlined. Thus far the only one in existence, the one in Milan, opened in 1910, has abundantly demonstrated its usefulness as shown by its annual reports, and many excellent intensive investigations have been prosecuted there. This institute possesses six clinical wards with a capacity of twelve beds each, besides isolation rooms, making a total capacity of eighty beds. There is a large dispensary and a pathological department with laboratories and a lecture hall. There are chemical and physical laboratories, a library, museum, rooms for animal experimentation, clinical microscopy, calorimetry, and radiography. Apparatus is installed for the study of electro-cardiograms, hydraulic pressure, analysis of explosive and other toxic gases, air analysis, microspectroscopy and microphotography, etc. The institute extends its work through visitation at their homes of artisans unable to attend the clinic, and instruction is given in hygiene to the families and friends of industrial workers. Students receive instruction and public conferences are held for discussion of the occupational diseases hazards. A similar institute with a capacity of 300 beds has been planned for Budapest, and such institutes are greatly needed in this country.

(5) The publication of statistics of the occupational diseases by hospitals and dispensaries is a most important matter, for at present it is with the utmost difficulty that one can collect reliable data as to morbidity in even the most hazardous industries. There is a decided tendency to seek remedies for obvious industrial hazards through legislation which is often hasty and ill advised, passed without adequate provision for its enforcement, and which frequently is unjust to the employer and fails really to benefit the employed. For example, there are states including anthrax and the caisson disease in their reporting laws, which have not a single caisson under operation in the state, and in which anthrax is never met with. This is merely be-

cause their reporting laws have been copied almost verbatim from that of New York State, which in turn copied its law from England. Meanwhile a large number of very important occupational diseases are suffered to remain unreported. Similarly many of the factory ventilation laws directed against dust inhalation hazards are inadequate and ill-advised. The hygienic betterment of the workingmen's environment has meanwhile been undertaken voluntarily by a number of the large manufacturing corporations as an economic gain—instance the United States Steel Corporation, the B. F. Goodrich Company and the duPont de Nemours Powder Company—in a manner most encouraging. And many manufacturing firms like those of the felt hat industry might be induced to mend their ways voluntarily if the path were pointed out to them through convincing morbidity statistics, accompanied by practical suggestions for betterment. It is preferable to lead than to drive when possible, and this Association might well assume leadership in directing and encouraging the educational campaign against the occupational diseases hazards, through stimulating the collection of reliable morbidity statistics, and promoting uniformity in their tabulation, as well as in formulating suggestions for betterment. And this work should begin by urging upon hospitals and dispensaries their duty in improving their statistical methods.

FIVE SECTIONAL CONFERENCES ON TUBERCULOSIS.

Sectional conferences on tuberculosis will be held during the month of October in New Haven, Conn., Louisville, Ky., Jackson, Miss., Newark, N. J., and Albuquerque, N. M., under the auspices of The National Association for the Study and Prevention of Tuberculosis, according to a bulletin issued recently.

The Louisville conference, which will comprise the Mississippi Valley States, will meet first on October 4, 5 and 6. The New England States Conference at New Haven will meet on October 12 and 13; the Albuquerque Conference, taking in the Southwestern States, on October 13 and 14; the North Atlantic States Conference at Newark on October 20 and 21, and the Conference for the Southern States at Jackson on October 30 and 31.

The governors of every state in the territory of each of these conferences will appoint delegates, and the mayors of practically all of the principal cities will send representatives. Chambers of commerce, state and county medical societies, anti-tuberculosis associations, women's clubs and other civic and social groups are being urged to send delegates to the conference in their various districts. The programs of each conference will be suited to the locality in which the conference is held. Speakers of national prominence will be present at these meetings.

The states comprised in the New England Conference are Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. The North Atlantic Conference states are New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia. The Southern Conference states are North and South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, and Louisiana. The Mississippi Valley Conference states are Michigan, Ohio, Indiana, Kentucky, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Arkansas, Kansas, Nebraska, North Dakota, and South Dakota. The Southwestern Conference will take in the states of Texas, Oklahoma, New Mexico, Colorado, Utah, Arizona, Nevada and California.

Anti-Tuberculosis workers are urged now to make plans to attend the conference in their own district or the one nearest to them.

Information about any of the conferences may be obtained from the office of The National Association for the Study and Prevention of Tuberculosis, 105 East 22d Street, New York.

THE HANDLING OF SHUCKED OYSTERS.

CARLETON BATES,

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Read before the Laboratory Section, American Public Health Association, Rochester, N. Y., September 10, 1915.

CONSIDERABLE attention has been given by bacteriologists and others interested in sanitation to the question of shell oysters. In the control of food shipments, the control of shucked or opened oysters is of equal importance to that of the shell stock. The control of the shell stock more particularly interests those officials charged with the enforcement of food laws in whose territory the oysters are grown. A systematic investigation is at present being carried on with regard to the pollution of the oyster beds throughout the entire Atlantic coast. These investigations are being conducted by coöperation between the various state officials, the Hygienic Laboratory, of the Treasury Department, and the Bureau of Chemistry, of the Department of Agriculture. The control of the sale of shucked oysters, however, more particularly interests inland food officials because of the greater amounts of oysters which are shipped inland in this condition.

Inland officials generally have no means or facilities for the examination of the shell stock or the inspection of shucking plants prior to the arrival of shipments into their territory. For the information of all parties interested, a series of experiments were conducted during the past oyster season with a view of studying the handling and shipping of the shucked stock to inland points. The work was undertaken in coöperation with the Kentucky Agricultural Experiment Station, to which place commercial shipments were made. Upon receipt of the shipments, the Kentucky officials conducted a series of experiments with regard to the control of the oysters during the sale through retail stores. A brief report of this part of the investigation was made by R. M. Allen* in his address before the Oyster Growers' & Dealers' Association of North America at the last annual meeting, held in Washington, D. C.

The investigations herein reported were conducted from January 1 to April 1, of this year. The general procedure included the analysis and inspection of the shell stock and of the shucked stock during each step in the process of preparation, such as, shucking, washing, chilling, and packing. All of the work was conducted in connection with the preparation of regular commercial shipments on a commercial scale.

Considerable improvement has been made during recent years in the sanitation of shucking establishments. The methods employed have also been changed, but during the course of the investigations old and new methods of preparation of the product for market were followed. These methods vary chiefly in elaborateness, the aims of both methods being the same.

Shell oysters after being received at the shucking houses are opened by skilled shuckers, these oysters being collected either in pails permitting the draining of the shell liquors, or in pails partially filled with water. After a shucker has a full pail, the opened stock is delivered to the washer, where they are washed for varying lengths of time. After washing, the oysters are chilled in water. At this point, the procedure varies greatly; in some instances oysters are chilled by being placed in a tank of ice water and allowed to remain for short periods of time, the oysters being agitated or not, according to the practice of the dealer. In other instances the oysters are placed in tanks of chilled water and agitated by means of air or water, or both. This latter method is known as the mechanical washer and chiller. After chilling, the oysters are drained on a culling board and are packed in the containers for shipping.

During the investigations the method for the bacteriological examination of oysters, as outlined by the writer and L. A. Round in a previous paper,† was employed. One of the facts developing from the work was a study of the bacteriological condition of the oyster meats during each step in the handling process. As has been reported,‡ in the examination of the shell stock, a composite sample of the shell

*The *Oysterman and Fisherman*, Vol. XII, No. 34, p. 38.

†Published in JOURNAL, August, 1916.

‡A Comparison of Bacteriological Methods for the Examination of Oysters by Carleton Bates and L. A. Round, to be read before the Laboratory Section of the A. P. H. A. on September 7–10, 1915.

liquors was first collected, from which five determinations were made and scored on the basis of the present "Standard Method." In this way, a comparison of the scores of the meats could be secured with that of the liquors.

These experiments consisted of fifteen shipments from the commercial houses to inland points. In view of the fact that the work was conducted on a commercial scale and with regular commercial shipments, the results obtained are doubly interesting. With each shipment, which was packed in ice, a second box was sent which contained a thermograph, also iced, to show whether or not the packages were re-iced in transit. The results of the shipping experiments are as follows:

TABLE SHOWING COMPARATIVE BACTERIAL COUNT AND B. COLI SCORE OF OYSTERS DURING VARIOUS STEPS IN THE HANDLING AND BEFORE AND AFTER SHIPMENT.

Shipping experiment No.	Description of sample.	Date of examination.	Meats. No. of colonies developing on plain agar after. 4 days incubation at 25° C.	Meats. No. of colonies developing on plain agar after. 48 hrs. incubation at 37° C.	Meats. B. coli score.	Liquors. No. of colonies developing on plain agar after. 4 days incubation at 25° C.	Liquors. No. of colonies developing on plain agar after. 48 hrs. incubation at 37° C.	Liquors. B. coli score.
1.	Shell stock, 24 hrs. off bed	1–15–15	2,200	450	1	1,950	430	0
	Same stock from shucker	1–15–15	1,600	150	2			
	Same stock at time of shipping	1–15–15	12,900	550	1			
	Same stock at time shipment arrived	1–18–15	140,000	1,500	5	69,000	9,500	10
2.	Shell stock, 6 days off bed	1–19–15	475	30	5	7,500	90	10
	Same stock from shucker's dipper	1–19–15	36,000	32,500	2	62,000	70	0
	Same stock at time of shipment	1–19–15	325	21	3			
	Same stock at time shipment arrived	1–21–15	27,500	1,300	41	10,800	950	8
3.	Shell stock 2 days off bed	1–22–15	30,000*	13,500*	50	4,300	1,700†	100†
	Same stock from shucker's dipper	1–22–15	1,600	85	2			
	Same stock from washer	1–22–15	4,100	56	2			
	Same stock at time of shipping	1–22–15	5,400‡	130‡	3			
	Same stock at time shipment arrived	1–25–15	49,000	1,300	0	8,000	1,250	0
4.	Shell stock 18 hrs. off bed	1–26–15	1,450	14	0	1,750	70	6
	Same stock from shucker's dipper	1–26–15	1,300	16	2			
	Same stock from washer	1–26–15	12,500	60	2			
	Same stock from chiller	1–26–15	11,500	155	2			
	Same stock at time of shipment	1–26–15	115,000	135	3			
	Same stock at time shipment arrived	1–29–15	47,500	750	5	38,500	1,300	2
5.	Shell stock 3 days off bed	1–29–15	70	28	0	370	65	6
	Same stock from shucker's dipper	1–29–15	4,900	28	0			
	Same stock at time of shipment	1–29–15	1,900§	27	0			
	Same stock at time shipment arrived	2– 1–15	12,500	1,250	32	30,000	3,100	6
6.	Shell stock 15 hrs. off bed	2– 5–15	1,450‖	240‖	0	14,400	60	2
	Same stock from shucker's dipper	2– 5–15	1,950	180	3			
	Same stock at time of shipment	2– 5–15	13,800	420	1			
	Same stock at time shipment arrived	2– 8–15	31,000	1,900	1	36,000	2,200	4
7.	Shell stock 5½ days off bed	2– 9–15	8,000	225	23	80,000	460	46
	Same stock at time of shipment	2– 9–15	30,000	365	50			
	Same stock at time shipment arrived	2–11–15	47,000	5,900	5	63,000	5,800	32

* Average of 2 plates. † Average of 3 plates. ‡ Average of 2 plates.
§ Average of 3 plates. ‖ Only one plate made.

TABLE SHOWING COMPARATIVE BACTERIAL COUNT AND B. COLI SCORE OF OYSTERS DURING VARIOUS STEPS IN THE HANDLING AND BEFORE AND AFTER SHIPMENT.—*Concluded.*

Shipping experiment No.	Description of sample.	Date of examination.	Meats.		B. coli score.	Liquors.		B. coli score.
			No. of colonies developing on plain agar after.			No. of colonies developing on plain agar after.		
			4 days incubation at 25° C.	48 hrs. incubation at 37° C.		4 days incubation at 25° C.	48 hrs. incubation at 37° C.	
8.	Shell stock 2 days off bed	2–12–15	1,500	95	3	7,700	320	10
	Same stock from shucker's dipper	2–12–15	20,000	200	3			
	Same stock at time of shipment	2–12–15	20,000	100	0			
	Same stock at time shipment arrived	2–15–15	85,000	800	0	126,000	1,400	0
9.	Shell stock 18 hrs. off bed	2–16–15	700	95	1	1,800	290	4
	Same stock from shucker's dipper	2–16–15	1,250	85	1			
	Same stock from chiller	2–16–15	15,000	35	3			
	Same stock at time of shipment	2–16–15	22,000	130	0			
	Same stock at time shipment arrived	2–18–15	40,000	980	0	12,000	450	4
10.	Shucked oysters at time of shipment	2–23–15	56,000	12,000	2	29,000	3,500	2
11.	Shell stock 7 days off bed	2–23–15	6,000	80	1	3,500	350	6
	Same stock from shucker's dipper	2–23–15	18,000	575	0			
	Same stock at time of shipment	2–23–15	72,000	34				
	Same stock at time shipment arrived	2–25–15	140,000	2,000	0	118,000	1,900	0
12.	Shell stock 24 hrs. off bed	2–26–15	5,200	275	2	17,500	510	6
	Same stock from shucker's dipper	2–26–15	6,000	4	1			
	Same stock at time of shipment	2–26–15	32,000	6	1			
	Same stock at time shipment arrived	3– 1–15	70,000	2,750	4	10,000	1,100	6
13.	Shell stock 24 hrs. off bed	3– 2–15	3,750	300	0	1,670	870	6
	Same stock from shucker's dipper	3– 2–15	3,000	235	1			
	Same stock at time of shipment	3– 2–15	9,000	100	0			
	Same stock at time shipment arrived	3– 4–15	29,000	1,500	0	25,000	280	0
14.	Shell stock 18 hrs. off bed	3– 5–15	45	10	5	1,100	390	4
	Same stock from shucker's basket	3– 5–15	1,100	86	23			
	Same stock at time of shipment	3– 5–15	120	10	4			
	Same stock at time shipment arrived	3– 8–15	29,000	550	4	39,500	750	2
15.	Shell stock 20 hrs. off bed	3– 9–15	180	36	3	950	50	10
	Same stock from shucker's dipper	3– 9–15	5,700	775	2			
	Same stock at time of shipment	3– 9–15	8,500	80	0			
	Same stock at time shipment arrived	3–12–15	34,000	380	2	24,500	475	0
16.	Shell stock 36 hrs. off bed	3–12–15	425	140	1	4,700	425	46
	Same stock from shucker's dipper	3–12–15	1,900	190	0			
	Same stock at time of shipment	3–12–15	350,000	325	2			
	Same stock at time shipment arrived	3–15–15	100,000	220	0	170,000	2,200	0

Discussion of Results.

From the tabulations, it can be noted that the total counts vary greatly with each step in the process of handling. In the case of shell stock, the opening was done in accordance with the description as outlined in the method. In the case of all the other steps, the results represent commercial practices. Naturally, every oyster cannot be cleaned when commercial shuckers are employed to the same extent as is done for laboratory experiments. At the shucking step, considerable dirt from the shell, pieces of shell, grit, etc., get into the shucked stock. The bacteriological counts obtained at this step will, therefore, appear greater than in those reported for the shell stock. After shucking, the oysters are washed and chilled. The general results show an increase in the numbers of bacteria present on the oysters, but the colon types remain practically constant throughout the entire process.

The experiments reported herein represent practices requiring varying lengths of time in the handling. Additional experiments were conducted in connection with these commercial shipments in which the length of time required in the handling was extended. These results were obtained from wholly experimental investigations and are not reported at this time in connection with the commercial work. It can be briefly stated, however, that the colon types of organisms remain constant even when longer intervals of time are employed than is the commercial practice.

The work herein reported more clearly shows the advisability of a method such as has been discussed. It warrants inland officials to draw temporary conclusions regarding the sanitary condition of the oyster beds from which the shucking stock is secured.

AIMING AT VOCATIONAL DISEASE.

That the workmen's compensation principle will ultimately be extended to include casualties resulting from vocational diseases, as well as those arising from accidents, was clearly foreshadowed in a conference held recently between officials of the Pennsylvania State Department of Labor and Industry and physicians and surgeons representing industrial plants throughout Pennsylvania and neighboring states. All concurred in the belief that it is high time to map out a definite course of action to meet the vocational disease problem, and as a result arrangements were made to establish a vocational disease clinic at the University of Pennsylvania Hospital, Philadelphia, under the supervision of Dr. Alfred Stengel. As far as is known, this will be the first clinic of its kind in America.

Doctor Stengel addressed the conference on the subject of extreme temperatures in relation to the workman's efficiency. He is positive that it is impossible for men to live long or do their best work if a "slow parboiling" is an incident of their employment. He said he hoped to clear up many phases of such industrial questions through the new clinic, but urged that until science had gathered a few more facts employers should err on the safe side and give the men the full benefit of the doubt wherever health is concerned.

In the matter of extreme temperatures, physicians representing the Carnegie Steel Company took a different view. They contended that physical collapse of workmen is due, not to extreme temperatures, but to squalid, insanitary home conditions and improperly prepared food. Dr. J. W. Schereschewsky, of the United States Public Health Service, suggested that shifts be shortened as temperature is increased.

Frequent physical examination of employees and the immediate elimination of any found to be physically unfit were put forth as constituting a plan that would reduce both accidents and contagion to a minimum.—*Factory*, September.

SUGGESTIONS FOR A TEST TO MEASURE THE DRAINABILITY OF EMSCHER TANK SLUDGE.

W. L. Stevenson,
Assistant Engineer, Sewage Disposal, Philadelphia.

Read before the Sanitary Engineering Section, American Public Health Association, Rochester, N. Y., September 10, 1915.

PRIOR to the use of the Emscher tank, it was expected that sludge from sedimentation or septic tanks would dry slowly, and it was therefore necessary in the design of works to provide ample space to receive and retain the liquid sludge until it had dried to a consistency fit to be removed to a dump.

The thorough digestion of organic matter in the sludge compartment of a mature Emscher tank results in a destruction of the sticky, colloidal matters, a breaking down of organized bodies into finely divided particles, and a material reduction both in the volume of the sludge and in its percentage moisture. It also causes the presence of gas which is compressed when the sludge is in the bottom of the tank, but which expands when reduced to normal pressure as the sludge is withdrawn.

This expansion causes the solid portion of the sludge to float upon the water, which, due to the above described conditions, very rapidly separates at the bottom, as shown in Figure 1. For these reasons, such sludge, applied to underdrained sand beds, will dry sufficiently to be removed in a few days instead of probably weeks or months with other kinds of sludge. The rapid drying permits the use of the same bed many times a year and it is common practice to provide only one square foot of drying bed for each three persons tributary to Emscher tanks. Hence the drainability of such sludge has become an important matter.

The methods of sludge analysis in most common use consisf in determining the percentage moisture and specific gravity of the wet mass and the percentage of the dry residue that is fixed and that which is fat or soluble in ether. These tests are principally of value to show, in an indirect way, the good or bad qualities of the sludge, and it seems that an additional test is required to measure drainability.

The real and essential properties of sludge, when it must be disposed of on land adjacent to habitations, are odor, volume and drainability. The writer is not acquainted with any better apparatus than the nose for determining the first, a foot rule for the second, and for the third the results of a few experiments are here offered in the hope that from them a simple test may be devised.

For some time it has been the writer's practice, in order to determine the propriety of removing sludge from Emscher tanks, to withdraw a small portion, place some on a white enameled plate, as suggested by Doctor Imhoff, and another portion in a glass measuring cylinder to see if the water would separate out at the bottom.

Since April of this year a composite sample of each batch of sludge placed on the drying beds at the Pennypack Creek Sewage Disposal Works has been submitted to the two following procedures:

A portion amounting to 700 cc. is placed in a 1,000 cc. measuring cylinder and the amount of clear water separated at the bottom observed and recorded at hourly intervals. This is continued until the sludge begins to settle down into the water again.

Another 700 cc. portion is placed in a vertical piece of glass tubing of the same internal diameter as the measuring cylinder. Over the lower end of the tube is secured a piece of wire screen which supports a one-half-inch layer of small pebbles, a one-half-inch layer of clean Jersey gravel, and a two-inch layer of fine sand. (The thickness of these layers could probably be reduced and thereby decrease the amount of entrained drain water.)

The tube is held in a retort stand over a funnel resting in a measuring cylinder to collect the water draining out of the sludge and the accumulated amount of water is read at hourly intervals until the sludge ceases to drain. Apparatus shown in Figure 2.

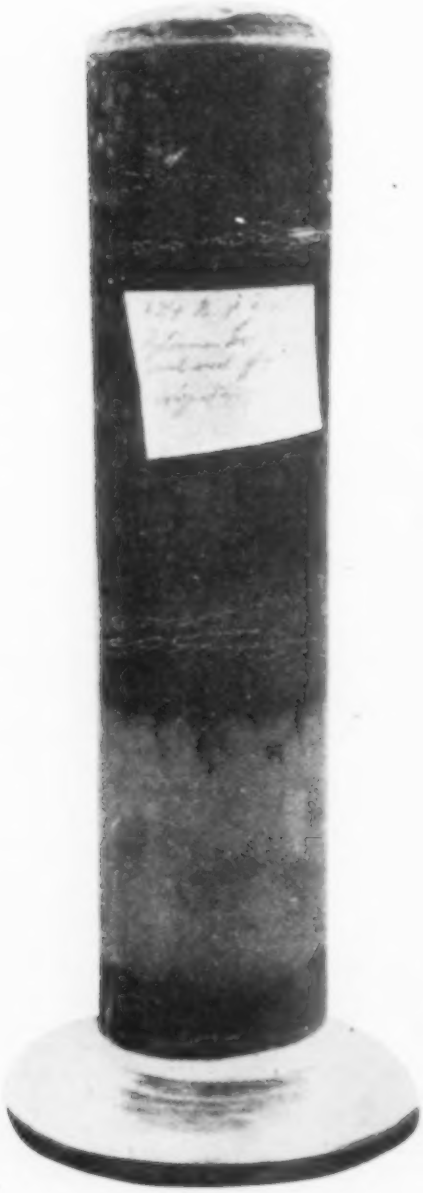


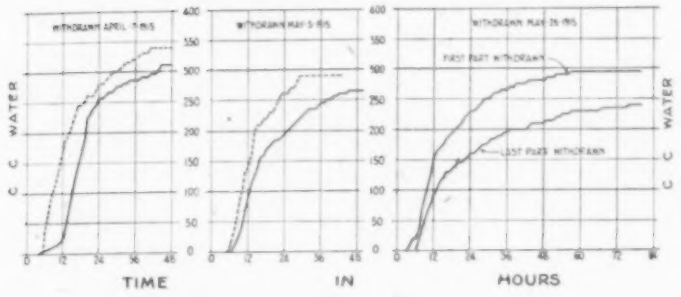
FIG. 1.

FIG. 2.

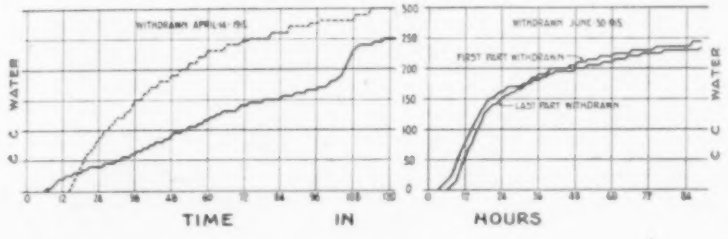
The results of the experiments are shown in Figure 3, also the usual analyses; the number of days required for the sludge, exposed to the weather on the drying beds, to reach a consistency fit to remove; and the rainfall and air temperature during those times.

It may also be stated that sludge from Emscher tanks No. 1 and No. 2 was unsatisfactory during the early operation of the plant and was found to be highly acid. This condition was corrected by the addition of lime water by means of a pipe extending through the ventilator to about mid-depth of the sludge.

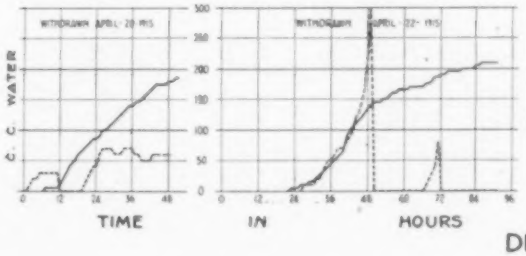
EMSCHER TANK NO. 2.



EMSCHER TANK NO. 1



FINAL SETTLING BASIN



SLUDGE DATA

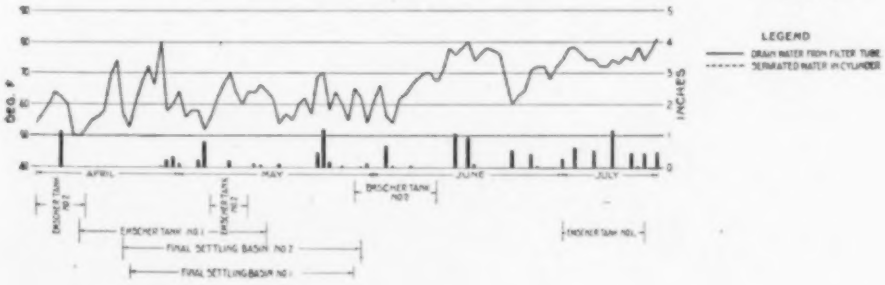
SOURCE	DATE	WET SLUDGE % MOISTURE	WET SLUDGE SPECIFIC GRAVITY	WET SLUDGE RATIO TO VOLUME OF ALKALINE	DRY RESIDUE % FIXED	DRY RESIDUE % FAT	COULD BE DRAWN FROM TANK (OR BED) IN DAYS
EMSCHER TANK							
FINAL SETTLING							

(A) FIRST PART
(B) LAST PART

TESTS OF DRAINABILITY OF SLUDGE

AIR TEMPERATURE AND RAINFALL

CITY OF PHILADELPHIA
BUREAU OF SURVEYS
SEWAGE DISPOSAL DIVISION



The settling basin is constructed in two parts. Instead of cleaning the side in service when it shows bubbling, the practice is to place the other side in service and allow the sludge to digest with a small flow of filter effluent passing over it. This has resulted in a practically inodorous sludge; but the water does not drain readily as from Emscher tank sludge.

In several instances the sludge placed in the measuring cylinder has begun to float on the water, after a few hours settled down, then separated and floated again.

Such action prevents obtaining a useful curve of drainability and it appears that the tube with filtering media is the better method.

An examination of the curves indicates that the factors which should be combined to obtain a number to represent the drainability of the sludge are:

(a) The rate of drainage represented by the slope of the first part of the curve.

(b) The ratio between the amount of water drained from a liter of sludge and the amount of moisture therein as determined by the usual evaporation method.

(c) The time required for the water to begin to drain out.

Good sludge will be indicated by (a) having a steep slope, (b) showing a large number for the ratio, and (c) showing a short time; bad sludge the reverse.

No attempts have been made to combine these three factors to form a number similar to the relative stability figure for filter effluents because the data are too meager and only sludge from one works treating a sewage which is two-thirds institutional has been used in the experiments.

But the writer believes that more extended study in some of the sewage works or testing station laboratories might develop a simple field test capable of being made by the type of operator usually found in the smaller works and that its use would serve to indicate a very important characteristic of Emscher tank sludge.

REAL PUBLIC HEALTH SERVICE.

Periodically we feel like alluding to and growing enthusiastic over one of the most brilliant pieces of public health service that we have ever known. We refer to the control by the United States Public Health Service of the bubonic plague situation in New Orleans.

Some two years ago, it will be remembered, there were eighteen or twenty cases, very close together, of bubonic plague in our southernmost city, most of which terminated fatally. In any other circumstances this would have been a quarantinable epidemic, and would have given rise to most acute alarm throughout the United States and indeed throughout the world. A high wall would have been built about New Orleans, constructively speaking, and intercourse with the rest of the world would have been prohibited, or put under such restrictions as to shut the people of that city off from social or commercial intercourse with the rest of the country. Immediately when this epidemic gave its first signs, the Public Health Service stepped in; that mere fact quieted whatever alarm may have started, and the justification for the country's entire confidence in that service is shown by what has transpired since. Not one single individual has had his freedom interfered with, not a steamer and not a train have been delayed or put out of service. The city of New Orleans has had as free communication with the rest of the country as any other city, and yet an immense amount of work has been done. The last human case of bubonic plague occurred in September, 1915, but only last week two rodent cases were confirmed. Intensive trapping of rodents and rat-proofing of dwellings was instituted in the neighborhood of their occurrence.

Since the first human case occurred in New Orleans two years ago, 795,186 rodents have been captured, of which 7,223 were captured during the week ending August 5, 1916. Down to date, 122,281 buildings in New Orleans have been rat-proofed. This is a record that needs no adjectives to describe.—*Modern Hospital*, September.

THE PROVIDENCE CITY HOSPITAL.

D. L. Richardson, M. D.,
Superintendent, Providence City Hospital, Providence, R. I.

Read before the Massachusetts Association of Board of Health, Providence, R. I., July 27, 1916.

THE City Hospital has for its purpose the treatment of all kinds of infectious diseases.

As completed in 1910 there were seven buildings situated on a 25-acre lot, and had a capacity of about 140 patients. In 1912 another building was added to accommodate patients suffering from advanced tuberculosis, and in which there are 60 beds, bringing the total capacity of the hospital up to about two hundred beds.

Its purpose has been to care for more than scarlet fever, diphtheria, and measles patients, for it stands ready to accept any kind of transmissible disease, and thereby rendering a widely useful service to the community. Many patients come from other hospitals and charitable institutions, from boats arriving at Providence, and some from the surrounding cities and towns when there is room for such. Many patients prove not to have any infectious disease, but are detained until they are well or a diagnosis has been made. Cases are not inspected before admission.

The treatment of so great a variety of infectious diseases in a few wards has been made possible by the introduction of aseptic nursing. The transmission of virus from one person to another takes place in most infectious diseases in this climate by more or less intimate contact with the sick patient. Air as a medium of infection is theoretically possible, but is of very little practical importance, except at very short range when a patient may expel by coughing or sneezing definite particles of secretion into one's face.

Aseptic nursing is not difficult to understand nor hard to carry out, once physicians and nurses fully realize its underlying principles, namely, the physical separation of patients suffering from different diseases, and the proper sterilization of everything which comes in contact with these patients. It is nothing more than the technique practiced in every operating room.

Patients are brought to the hospital either in an ambulance or a town car, depending on the age of the patient, and whether he is too ill to walk or sit up. The ambulance driver and attendant wear washable coats, and the attendant sees to it that the patient comes in contact with interior of the vehicle as little as possible. Between trips the coats, blankets, and pillow slips are changed; the driver and attendant wash their hands, and only the interior in contact with patient is washed with soap and water.

Since the opening of the hospital to September 1, 1915, 4,446 patients had been transported to the hospital in this way, and I am satisfied that no patient has contracted an infectious disease from the ambulance or attendants.

The patient is first deposited in an

admitting room, where all outside clothing is removed and the patient made ready for examination. In some wards no admitting room is used and the patient goes directly to the bed assigned. At this point it is highly important that the admitting physician see the patient promptly to make a diagnosis and send him to the proper room or ward. Mistakes in diagnosis on admission are frequently the cause of later trouble. If there is no doubt about the diagnosis the patient is placed in the same unit with others suffering from the same disease.

All new patients are kept in side rooms for an observation period of one week. The rooms do not contain over three or four beds. If at the end of the period nothing further develops and the diagnosis seems certain, he is transferred to the convalescent ward. These new cases are indicated by cards marked "Detention."

In case patients are admitted to a ward with a doubtful diagnosis or suffer either from mixed infection or some other disease than is treated in that ward, the bed or door of a room for a single patient is designated by a red card with the word "Barriered" on it. Whether such patients are in single rooms or a room for several patients the cards indicate separate units, and the nurses see to it that patients in different units do not mingle, and carry out rigid asepsis between these units.

There are in use either one or two wards for scarlet fever, one for diphtheria, and three others for various other infectious diseases. In two of the latter only graduate nurses or pupils who are especially capable are employed. Into these two are placed all chicken-pox and measles patients, and a few other highly transmissible infections like smallpox, or typhus fever. These wards are also used for any other infectious disease as well as patients kept for observation.

Contained careful observation of the patients by physicians aided by nurses must be maintained to detect the onset of any other infectious disease at the earliest possible moment.

To simplify the technique only the rooms occupied by patients or toilet rooms to which they go are considered infected area. The corridor, the utility rooms and admitting rooms are used just as in any general hospital. But anyone who has touched any patient or anything in this room must scrub the hands before leaving, and all utensils must be cleaned or sterilized when removed. Infected linen is sent to the laundry, all possible utensils are boiled, some nursing articles are washed with soap and water and put out in the air, and mattresses and pillows are aired only, except when the patient dies or is discharged during the acute process of the disease, or in the case of smallpox or typhus fever when they are sterilized by steam.

Patients on discharge receive a soap and water bath. Most of the wards are provided with a discharging room into which the patient is placed after his bath, and where he stays until next day when his parents come for him. On discharge of the patient the linen is sent to the laundry; mattress and pillows aired or sterilized; and all utensils either boiled or immersed in an antiseptic solution, the bed,

bed-side table, chair, and lavatory are washed with soap and water, and in the isolation wards the floor and walls within easy reach are also washed with soap and water. Rooms have never been fumigated since the opening record of the room or rooms occupied by each patient, and have never been able to trace any cross infection to this source.

All employees are properly protected against smallpox, and cultures taken when they go on duty. It is highly important to watch all employees for acute illness, and exclude them from service if there is any suspicion of the onset of any infectious disease.

There should be plenty of nurses to care of the patients. In some of the wards there is one nurse for every three patients, in others one for five or six. This is important to prevent breakdown of the technique and furnish the best possible care of the patients. Money spent on skilled medical and nursing care of patients suffering from acute infectious disease, will bring big returns in the saving of life, and prevention of subsequent sequellæ.

Cross infections do occur. The two diseases with which there is much trouble are measles and chicken-pox. The infections with other infectious diseases are very small.

The success or failure of the methods outlined may be judged by the incidence of secondary diseases among patients, and hospital staff.

From March 1, 1910, to January 1, 1916, 6,748 patients had been discharged from the hospital and suffering from the following diseases:

Chicken-pox	56
Diphtheria	1,592
Measles	448
Rubella	28
Scarlet fever	1,415
Syphilis	1,280
Tuberculosis	784
Whooping-cough	157
Other diseases and mixed infections	988
Total	6,748

Among them occurred 166 cross infections. The diseases contracted were as follows:

Measles	48
Chicken-pox	78
Scarlet fever	19
Diphtheria	10
Rubella	4
Whooping-cough	4
Mumps	3
Total	166

It will be noted that 126 of the 166 were measles and chicken-pox. The total incidence for the whole hospital was 2.4 per cent. If from the total number of discharges 2,059 adult patients suffering from tuberculosis and syphilis were subtracted leaving 4,689, nearly all of which were children, the incidence is 3.5 per cent. There has never been a cross infection among the 2,059 tuberculosis and syphilitic patients.

It is interesting to analyze still further and note the percentage of cross infection among patients in the three isolation wards where a great variety of infectious diseases were treated. In these wards 2,788 patients, exclusive of adult syphilitics, were treated. The residence of 1,730 was more than seven days and of 1,058 less than a week. Ninety-two cross infections developed, an incidence of 3.3 per cent. slightly less than

for the whole hospital excluding tuberculosis and syphilitic patients.

Among 867 patients treated in these wards during 1913–1914 a careful analysis of the histories was made to determine how many there were who might by immunity have been protected from contracting scarlet fever, diphtheria, measles, chicken-pox, and whooping-cough.

The results are as follows:

Scarlet Fever	
Immune (apparently)	223
Susceptible	448
Unknown	173
Cross infections	3
Diphtheria	
Immune (apparently)	154
Susceptible	517
Unknown	138
Cross infections	1
Measles	
Immune (apparently)	428
Susceptible	275
Unknown	143
Cross infections	5
Chicken-Pox	
Immune (apparently)	150
Susceptible	507
Unknown	143
Cross infections	7
Whooping-Cough	
Immune (apparently)	230
Susceptible	431
Unknown	146
Cross infections	1

Nearly all instances of infectious diseases arising among employees have occurred among pupil nurses. These nurses come from several New England hospitals for a two months' training in infectious diseases.

From March 1, 1910, to March 1, 1915, the following nurses have been employed in the hospital: Pupil nurses, 353; graduate nurses, 46; attendant nurses, 25; total, 424. Of the 424 nurses, 64 had previously had diphtheria, and 19 pupils and 1 graduate contracted the disease. It is interesting to note that 9 nurses were diphtheria carriers when they entered upon their duties while only 9 developed the carrier state while working in the hospital. Cultures have been taken routinely when they enter upon their duties and when they leave. One hundred twenty-one had previously had scarlet fever and 19 pupils and 1 graduate contracted the disease; 335 had previously had measles and none contracted it: 50 had previously had rubella and 2 pupils and 2 graduates developed the disease; 184 had had mumps and only 2 contracted this disease.

Among 229 employees, during the same period, 5 contracted an infectious disease; 2 ward maids contracted scarlet fever; 2 laundry maids contracted the same disease; 1 nurse maid contracted both scarlet fever and diphtheria.

In conclusion it is fair to state that air infection if it does take place is rather a rare occurrence; that rigid asepsis is of primary importance. Hospitals for infectious diseases and for children should not have wards of over six or ten beds each and should be provided with sufficient smaller units, whether rooms or compartments, to accommodate all new patients for an observation period. Conservative and accurate diagnosis on the admission of patients and careful supervision will prevent the entrance or continued residence in the same unit of patients suffering from more than a single transmissible infectious disease.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE regular quarterly meeting of the Massachusetts Association of Boards of Health was held in the City Hospital at Providence, R. I., Thursday, July 27, 1916, with the President, Dr. Frank A. Woods of Holyoke, in the chair.

It was voted to dispense with the reading of the records of the preceding meeting.

It was unanimously voted to accept the following applicants as members of the Association: Dr. Arthur A. Brown, State District Health Officer, Swampscott, Mass.; Mr. Charles I. Burrows, Board of Health, Lynn, Mass.; Dr. William J. Hatchett, 28 Arlington St., Somerville, Mass.; Miss Grace O'Bryan, 561 Massachusetts Ave., Boston, Mass.; Dr. Thomas Tetreau, City Health Officer, Portland, Me.; Dr. F. Van Nüys, Board of Health, Weston, Mass.

His Honor, Mayor Joseph H. Gainer, Chairman of the Board of Hospital Commissioners, delivered the following address of welcome:

"It gives me a great deal of pleasure, today, as chairman of the City Hospital Commission and as Mayor of the City of Providence, to extend to the Massachusetts Association of Boards of Health, and health officers of the state a very hearty welcome. Our City Hospital is governed, as you know, by a City Hospital Commission. While this Commission is a separate department from the health department, it is nevertheless closely affiliated with it. Doctor Chapin, our Superintendent of Health, is secretary of the City Hospital Commission. He has been deeply interested in the hospital since its foundation, and together with Doctor Richardson, the superintendent, is entitled to the credit of its success. Another point of relation between the City Hospital and the City's Health Department is the fact that the Board of Health in Providence is the Board of Aldermen. The Mayor is chairman of that body, and chairman of the Hospital Commission, while two of three elective members of the Hospital Commission, are Aldermen and members of the Health Committee of that board.

"It is therefore appropriate that the City Hospital should furnish a birthday party for the Health Department. Last winter, I am informed, the Health Department of the City of New York celebrated its fiftieth birthday, today, we celebrate our sixtieth birthday.

"Doctor Emerson, the Health Commissioner of New York, while searching the early records for his department, in preparation for its anniversary, found that in preparing the health work of the City of New York in the sixties, New York sought the advice and assistance of the Superintendent of Health of Providence. In a recent study of health work made by Doctor Chapin, he found that Massachusetts ranked first among the States of the

Union. It is no wonder then that our Health Department with its long history of service is pleased and honored to have the health officers of Massachusetts here to help us in our celebration. We trust you will enjoy the occasion with us.

"Ordinarily, we furnish to our visitors the Rhode Island clam. Today, however, as we are entertaining distinguished health officers, we find that we must make a change in our program. We are not giving you the Rhode Island clam, because we have no health officer to guarantee the article. Professor Gorham could give us a very satisfactory guarantee, if the foodstuff in question happened to be oysters, but he has no jurisdiction over clams. In Massachusetts, we understand your health officer, Doctor McLaughlin, has such jurisdiction. We have, therefore, gone to Massachusetts and imported the Massachusetts clam; so we know you will have no hesitancy in enjoying the dinner now that you know proper health precautions have been taken for your safety."

The following program was then presented:

"The Sixtieth Birthday of the Providence Health Department." By Charles V. Chapin, M. D., Superintendent of Health.

"The Providence City Hospital." By D. L. Richardson, M. D., Superintendent.

"Relative Value of Different Lines of Health Work." By Franz Schneider, Jr., of the Russell Sage Foundation.

A motion of Doctor Palmer was unanimously carried to extend to the Commissioners of the Providence City Hospital a rising vote of thanks for their royal entertainment of the Association.

The meeting was then adjourned.

CHILD LABOR IN THE FAR EAST.

Japan's first child labor law went into effect on June 1. It is a very inadequate law providing a 12-year limit, a 12-hour day, a 7-day week and prohibition of night work between 10 p. m. and 4 a. m. The inadequacy of these provisions is increased by weakening exemptions so that the law can hardly be considered more than an acknowledgment of the principle that the protection of the child is essential to the development of the nation. It is the law of recurrence again. Japan is passing from the agricultural to the industrial stage and is suffering from all the ills that attended similar developments in England and the United States. The strange part about it is that as each country goes through this stage it seems unable to learn from the experience of other countries. Japan has discovered, as did England, that the men from her industrial sections are not measuring up to military standards. Frightened by this, she raises her age limit from nothing to 12, with exemptions to 10 years, provides a 12- to 14-hour work day, and a working week of 7 days! Yet the standards that other countries have found it necessary to adopt are not unknown to her, for only a year or two ago some of her influential citizens sent to the National Child Labor Committee for information about the child labor movement in this country. Perhaps, though, Japan took as a guide some of the states which have not yet learned their industrial lesson from England and the older industrial states. We still have four states which permit an 11-hour day; three states which have no 14-year limit; and nine states which do not prohibit night work.—*The Child Labor Bulletin.*

MINUTES OF THE FORTY-THIRD MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

ROCHESTER, NEW YORK, SEPTEMBER 7 TO 10, 1915.

First Session.

The Forty-Third Annual Meeting of the American Public Health Association was called to order at the Central Presbyterian Church, Rochester, New York, Tuesday, September 7, at 9 a. m.

In the absence of President Sedgwick, the meeting was called to order by the Secretary.

On motion, the minutes of the last meeting, having been printed and distributed, were, by unanimous consent, approved without reading.

There being no further business the meeting adjourned.

Selskar M. Gunn,
Secretary.

Second Session.

The meeting was called to order, Tuesday, September 7, at 2 p. m.

This session of the Association constituted the symposium on milk, and the following papers were read:

The Purposes of the Grading of Market Milk. Dr. W. H. Park, Director of Laboratories, New York City Health Department.

The Experience of New York City in the Grading of Market Milk. Lucius P. Brown, Director of the Bureau of Food Inspection of the New York City Health Department.

The Grading of Milk in Small Communities. Dr. Linsly R. Williams, Deputy Commissioner of Health, New York State.

The Degree of Accuracy of Bacteriological Analyses of Milk. Prof. H. W. Conn, Wesleyan University.

Some Observations upon the Causation of High Bacterial Counts in Market Milk. Dr. H. D. Pease, Lederle Laboratories, New York City.

Sanitary Measures of Primary Importance in the Production of Clean Milk (Illustrated). Dr. C. E. North, North Public Health Bureau.

Vice-President Hastings then took the chair. The papers were discussed by Drs. Clark, Campbell, Hastings, Smith, Slack, Mahady, Robertson, Park, Mr. L. P. Brown, Dr. L. R. Williams, Professor Conn, Dr. H. D. Pease.

Following the discussion Vice-President Hastings called Prof. H. W. Conn to the chair. Mr. F. D. Bell, as Chairman, presented the Report of the Committee on Cold Storage. On motion it was voted to refer the report of the Cold Storage Committee to the Executive Committee.

Upon motion the meeting adjourned.

Selskar M. Gunn,
Secretary.

Third Session.

Open Meeting.

The open meeting of the Association was called to order by President

Sedgwick in Convention Hall at 7.45 p. m., September 7.

The following addresses were given:

Address of Welcome, Hon. Charles S. Whitman, Governor of the State of New York.

Address of Welcome, Hon. Hiram H. Edgerton, Mayor of Rochester.

Memorial address on the life of the late Captain Henry Lomb of Rochester, Dr. Clarence A. Barbour, President Rochester Theological Seminary.

Following Doctor Barbour's address, Dr. Stephen Smith, First President of the American Public Health Association, came upon the platform and was presented by President Sedgwick.

Major-General Wm. C. Gorgas, M. D., then delivered an address in memory of Carlos Finlay, M. D.

Following the address by General Gorgas the Chairman called on Dr. Frederick Montizambert, Director General of Public Health of the Dominion of Canada, who spoke briefly in behalf of the Canadian members of the Association.

Vice-President Hastings of the Association then assumed the chair, and, after calling upon Dr. Montgomery E. Leary for some announcements, introduced President William T. Sedgwick, who delivered his presidential address on "Achievements and Failures in Public Health Work."

The meeting then adjourned.

WILLIAM T. SEDGWICK,
President.

SELSKAR M. GUNN,
Secretary.

FOURTH SESSION.

The meeting was called to order by the President in the old auditorium of the Central Presbyterian Church at 10 a. m., September 8. After an address by Dr. Stephen Smith of New York, First President of the Association, the following papers, constituting the symposium on Public Health Education, were presented:

Organization of a Plan of Public Health Education in New York State. Prof. C.-E. A. Winslow, Director, Division of Publicity and Education, New York State Department of Health.

Printer's Ink as a Life-Saver. E. A. Moree, Assistant Secretary, New York State Charities Aid Association.

Public Health Work through the Press in North Carolina. Warren Booker, C. E., Chief, Bureau of Engineering and Education, North Carolina State Board of Health.

Some Features of Public Health Education in New York City. Dr. Charles F. Bolduan, Director, Bureau of Public Health Education, New York City Health Department.

"Live a Little Longer," the Triple Alliance between the Public, the Physician and the School. Miss Melissa E Bingeman, Secretary, Live a Little Longer Committee, Rochester Chamber of Commerce.

The Rôle of the Newspaper in the Dissemination of Public Health News. Dr. W. A. Evans, Health Editor, Chicago *Tribune*.

Following the reading of the papers the meeting was opened for discussion. In the course of this discussion, upon motion it was voted that the Presi-

dent of the Association appoint a committee to take some action concerning the newspaper promotion of public health work. This motion was referred to the Executive Committee.

A resolution approving the "Live a Little Longer" plan, outlined by Miss Bingeman, was introduced and referred to the Executive Committee.

The meeting then listened to the report of the Committee on the Revision of the Constitution and By-Laws. This was presented by Dr. Frankel, Chairman. The draft for a constitution was discussed section by section, and certain amendments were adopted by motion.

It was voted that the constitution be adopted. The proposed by-laws were then considered and amended and upon motion it was voted that the by-laws be adopted as amended.

The meeting then adjourned.

The by-laws and constitution as adopted are here set forth at length:

CONSTITUTION AND BY-LAWS.

Article 1.

Name.

The name of this Association is The American Public Health Association.

Article 2.

Object.

The object of this Association is to protect and promote public and personal health.

Article 3.

Membership.

All persons and organizations in the United States of America, the Dominion of Canada, the Republic of Mexico, the Republic of Cuba, and other American nations, in sympathy with the object of the Association, are eligible to membership; provided that honorary members may be elected without regard to their place of residence.

Article 4.

Officers.

The officers of this Association are a president, three vice-presidents, a secretary, and a treasurer. The president, vice-presidents, and treasurer shall be elected by the Association and shall serve from the close of the annual meeting at which they are elected until the close of the next annual meeting, and until their successors are elected and qualified. The secretary shall be elected by the Board of Directors and shall serve for such a term as it may specify.

Article 5.

Administration.

Board of Directors. The affairs of this Association shall be administered by a Board of Directors, consisting of the officers, all ex-presidents, a member designated annually by each section, and thirty additional directors. The Association, at its meeting held in Rochester, New York, in 1915, shall elect ten directors to serve one year, ten to serve two years, and ten to serve three years, and thereafter ten directors shall be elected each year, to serve for a full term of three years. In the organization of the Board of Directors, representation shall be given as far as practicable to every section of the nations represented in the Association.

Advisory Council. Nominations of officers and directors shall be made by an Advisory Council. The Advisory Council shall consist of one representative from each state, province, territory, or district; one from each army and navy medical and hygienic board; and one from each federal department or bureau of the nations represented in the Association, dealing with phases of public health; together with one representative not otherwise eligible, to be elected annually by each section of the Association. Provided, that this article shall not be construed to deprive any member of the Association of his right to make nominations.

ARTICLE 6.

Meetings.

Meetings of the Association shall be held at such times and places as may be directed under the by-laws. Twenty-five members shall constitute a quorum.

ARTICLE 7.

Saving Clause.

This constitution shall take effect immediately upon its adoption by the Association, but it shall not be construed to invalidate any act of the Association, or of any officer or committee thereof, done in accordance with the preceding constitution prior to or pending organization under this constitution.

ARTICLE 8.

Amendments.

This constitution may be amended by a two-thirds vote of the members present and voting at an annual meeting of the Association; provided, that the call for such meeting shall have specified the particular amendment which is to be acted upon, and provided also that no amendment shall be acted upon before the annual meeting following that at which it was proposed.

BY-LAWS.

ARTICLE 1.

Membership.

Section 1. All members of the Association on September 8, 1915, and all persons and organizations subsequently elected to membership, are members of the Association so long as they conform to its constitution and by-laws.

Section 2. Membership is of four kinds: (a) Honorary; (b) Active; (c) Sustaining; (d) Corporate. An honorary member is a person elected to membership of that class by the Association, for distinguished service to the objects for which the Association stands. Organizations not engaged primarily in the conservation and promotion of public health shall be eligible to corporate membership only; other organizations and persons so engaged may be elected as active or sustaining members. Corporate, active, and sustaining members shall be elected by the Executive Committee.

Section 3. The dues of active members are $5.00 a year; of sustaining members not less that $25.00 a year; and of corporate members not less than $50.00 a year. Honorary members pay no dues. Dues are

payable in advance. Such part of the dues paid by any member as may be determined by the Executive Committee shall be applied to the payment of his subscription to the Official Journal of the Association.

ARTICLE 2.

Advisory Council.

Each member of the Advisory Council representing a state, province, territory or district shall be elected by the members of the Association resident in the jurisdiction which he represents, either before or at the annual meeting. His election shall be reported in writing to the secretary, and he shall hold office until the next annual meeting and until his successor is elected. In the event of the failure of any such jurisdictional group so to report, the executive committee shall appoint a representative *pro tem*.

The Advisory Council shall meet not later than the second session of each annual meeting, on the call of the secretary of the Association, and shall report nominations for officers and directors, not later than the day following. Such nominations shall not be acted upon by the Association before the day next following. A quorum of the Advisory Council shall be twenty members.

ARTICLE 3.

Board of Directors.

The planning of the work of the Association, the organization of sections, arrangements for meetings and congresses, and all other matters pertaining to the administration of its affairs, shall be vested in the Board of Directors, except as otherwise herein expressly provided. The president of the Association shall serve as chairman of the board. The board shall make its own rules.

The Board of Directors shall have power to fill vacancies among the officers and directors until appointed at the next annual meeting of the Association, and to appoint such committees as it may deem desirable.

Seven directors shall constitute a quorum.

ARTICLE 4.

Executive Committee.

There shall be an Executive Committee, consisting of seven members of the Board of Directors. The Board of Directors shall appoint four members, and the president, secretary, and treasurer shall be members *ex-officio*. The executive work of the Association shall be performed by the Executive Committee.

The president may designate any vice-president, or, if none available, a member of the Board of Directors, to serve as acting president in case of the absence or disability of the president, and in the event of his failure to do so, the Executive Committee shall make such designation.

ARTICLE 5.

Meetings.

There shall be at least one stated annual meeting of the Association, at a time and place to be fixed by the Board of Directors. Other meetings of the Association may be called by the board at such times as it deems proper.

ARTICLE 6.

Amendments.

These by-laws may be amended by the vote of a majority of all the members of the Association present and voting at any annual meeting, the call for which shall have specified the particular amendment to be acted upon.

Adopted at Rochester, N. Y., September 19, 1915.

WILLIAM T. SEDGWICK,
President.
SELSKAR M. GUNN,
Secretary.

Following this meeting the members present from various states gathered together for the selection of representatives to the Advisory Council.

FIFTH SESSION.

The meeting was called to order by President Sedgwick in the old auditorium of the Central Presbyterian Church at 2 p. m., September 9.

The following papers constituting the symposium on the Death-rate of the Higher Age Groups were read:

Increasing Organic Disease. Mr. E. E. Rittenhouse, President of the Life Extension Institute.

Possibility of Reducing Mortality from Diseases of the Heart, Blood-vessels and Kidneys. Dr. E. L. Fisk, Director of Hygiene, Life Extension Institute.

Cancer and the Public Health Service. Dr. Francis C. Wood, Director Cancer Research, Crocker Laboratory, New York City.

These papers were discussed by Dr. Haven Emerson, Dr. Woods Hutchinson, Dr. Hermann Biggs, Mr. Curtis Lakeman.

Following the discussion of these papers the following was presented:

Studies on the Relation Between Vaccine Virus and Post-Vaccination Tetanus. Dr. John F. Anderson, Director Hygienic Laboratory, U. S. Public Health Service, Washington, D. C.

The report of the Standing Committee on Habit Forming Drugs was then presented by Mr. Lucius P. Brown, Bureau of Food Inspection, New York City. A motion to submit copies of this report was referred to the Board of Directors.

The following papers by members of the Standing Committee on Habit Forming Drugs were then read:

The Suppression of the Drug Vice Considered from the Demand Side. J. Frank Chase, Secretary of the New England Watch and Ward Society, Boston, Mass.

Six Months of the Harrison Act. Dr. C. E. Terry, Jacksonville, Fla.

The following papers were read by title:

Drug Education for the Schools. Miss Jeannette Marks, South Hadley, Mass.

State Institutional Treatment of Drug Addicts. Dr. George Donohoe, Cherokee, Ia.

These papers were discussed by Doctors Goodale, Bullard, Harris, J. C. Kerr, A. E. Young, and Mrs. S. H. Adams and L. P. Brown.

The meeting then adjourned.

WILLIAM T. SEDGWICK,
President.
SELSKAR M. GUNN,
Secretary.

SIXTH SESSION.

The meeting was called to order by President Sedgwick in the old auditorium of the Central Presbyterian Church at 9 a. m., September 10. The Secretary presented the report of the Advisory Council.

Meeting of the Advisory Council.

The Advisory Council of the American Public Health Association was called to order by the Secretary at 12 p. m., Mechanics Institute, Rochester, N. Y., September 9, 1915.

The Secretary read the roll call, and 55 members were present.

Surgeon-General W. C. Gorgas was elected Chairman and Dr. D. L. Harris, Secretary.

The following members of the Association were nominated by ballot for the offices stated immediately preceding their respective names:

President, Dr. John F. Anderson, New Brunswick, N. J.; First Vice-President, Dr. George W. Goler, Rochester, N. Y.; Second Vice-President, Dr. Charles J. Hastings, Toronto, Canada; Third Vice-President, Dr. Omer R. Gillette, Colorado Springs, Colo.; Secretary, Professor Selskar M. Gunn, Boston, Mass. (for two years); Treasurer, Dr. Lee K. Frankel, New York, N. Y.

The following members of the Association were nominated for the Board of Directors:

Directors for Three Years: C. Harris, M. D., Memphis, Tenn.; William H. Park, M. D., New York, N. Y.; Livingston Farrand, M. D., Boulder, Colo.; Charles V. Chapin, M. D., Providence, R. I.; H. W. Conn, Ph. D., Middletown, Conn.; William M. Cobleigh, Bozeman, Mont.; Guilford H. Sumner, M. D., Des Moines, Iowa; Oscar W. Dowling, M. D., New Orleans, La.; M. P. Ravenel, M. D., Columbia, Mo.; Ernest C. Levy, M. D., Richmond, Va.

Directors for Two Years: Burdett L. Arms, M. D., Montgomery, Ala.; Edwin F. Ladd, Fargo, N. D.; E. M. Wood, M. D., Winnipeg, Manitoba; Jesus E. Monjaras, M. D., Mexico City; Gordon Bell, M. D., Winnipeg, Manitoba; Charles S. Caverly, M. D., Rutland, Vt.; T. D. Tuttle, M. D., Seattle, Wash.; Pearl M. Hall, M. D., Minneapolis, Minn.; Aristides Agramonte, M. D., Havana, Cuba; H. H. Morgan, M. D., Indianapolis, Ind.

Directors for One Year: Maurice M. Seymour, M. D., Regina, Sask.; William A. Evans, M. D., Chicago, Ill.; Charles E. Terry, M. D., Jacksonville, Fla.; Sam E. Eason, M. D., New Albany, Miss.; Hoyt E. Dearholt, M. D., Milwaukee, Wis.; James A. Hayne, M. D., Columbia, S. C.; Wilmer R. Batt, M. D., Harrisburg, Pa.; Raymond B. Fitzrandolph, Trenton, N. J.; John L. Burkhart, M. D., Lansing, Mich.; John S. Fulton, M. D., Baltimore, Md.

The following were recommended for Honorary Membership: Surgeon-General W. C. Gorgas, Dr. Stephen Smith, Dr. Frederick Montizambert, Dr. Henry D. Holton.

W. C. GORGAS,
Chairman.
D. L. HARRIS,
Secretary.

It was unanimously voted that the report of the Advisory Council be adopted. It was voted that the name of Surgeon-General George M. Sternberg be added to the list of Honorary Members presented by the Advisory Council.

The following papers, constituting the symposium on the Administrative Control of Infectious Diseases, were read:

Principles of Administrative Control of Communicable Diseases in Large Cities. Dr. John S. Billings, Director, Bureau of Preventable Diseases, Department of Health, New York City.

The Part Played by Laboratory Methods and Research in the Control of Communicable Diseases. Dr. William H. Park, Director, Bureau of Laboratories, Department of Health, New York City.

The Control of Communicable Diseases in Schools. Dr. S. Josephine Baker, Director, Bureau of Child Hygiene, Department of Health, New York City.

The Part Played by Hospitals in Controlling Communicable Disease. Dr. Robert J. Wilson, Director, Bureau of Hospitals, Department of Health, New York City.

Is the Control of Measles and Whooping-Cough Practicable? F. G. Curtis, M. D., City Hall, West Newton, Mass.

The Control of Scarlet Fever. A. J. Chesley, M. D., State Board of Health, Minneapolis, Minn.

The Value of Isolation Hospitals for Small Cities. C. S. Caverly, M. D., Rutland, Vt.

The Value of the Public Health Nurse in the Control of Communicable Diseases. C. J. Hastings, M. D., Health Officer, Toronto, Ont.

Disinfection as a Factor in the Control of Communicable Diseases. B. F. Knause, M. D., Brooklyn, N. Y.

The papers were discussed by Drs. G. W. Goler, Sears, Meyer, Solis-Cohen, S. L. Jepson, Edsall, Young, Gillihan, H. Albert, J. N. Hartz, J. Baker, Knause, and Hastings.

This symposium was given under the joint direction of the Section of Public Health Administration and of the New York City Health Department.

Following the discussion, Mrs. Allie C. Clement was granted the floor for the purpose of speaking on the subject of Woman Suffrage. She offered a resolution, which was ordered to be submitted to the Executive Committee.

WILLIAM T. SEDGWICK,
President.
SELSKAR M. GUNN,
Secretary.

FINAL MEETING.

The meeting was called to order by Vice-President Hastings, September 10, at 5 p. m., in the Mechanics Institute. The Secretary read the following announcement:

The Board of Directors begs to announce that Cincinnati was the unanimous choice for the 1916 meeting. The Board also wishes to announce that the four elective members of the Executive Committee are Dr. Evans, of Chicago, Dr. Holton, of Brattleboro, Vt., Dr. Chapin, of Providence, and Dr. E. C. Levy, of Richmond, Va.;

these four men, with the President, Secretary and Treasurer, make up the Executive Committee.

The following resolution, having been approved by the Board of Directors, was submitted to the Association:

WHEREAS, The widespread use of and traffic in patent medicines and secret nostrums constitutes a grave menace to the public health, and

WHEREAS, Such patent medicines and nostrums, because of the deceptive advertising regularly employed in promoting their sale, consistently oppose the influences seeking to educate the public to a better understanding of the nature, causes and proper treatment of disease, and

WHEREAS, The bulwark of this traffic is secrecy and mystery,

Be It Resolved, That the American Public Health Association oppose the sale of patent medicines and nostrums whose constituents are unknown to the health authorities; and

Be It Further Resolved, That this Association heartily endorse the ordinance of the New York City Department of Health, requiring the manufacturers of proprietary remedies, sold without a physician's prescription, to file with the Department a statement of its active constituents and therapeutic claims, and

Be It Further Resolved, That this Association recommend to other municipalities the adoption of this or similar measures for the proper safeguarding of the public health.

The resolution was adopted.

The following resolution having been approved by the Board of Directors was submitted to the Association:

Resolved, The utilization of established educational facilities within any state or city for the education of the entire population both children and adults with respect to the protection and promotion of health should be fostered in every community with the coöperation of the established health authorities.

The resolution was adopted.

Notice was hereby given of a proposed amendment to the constitution as follows:

Amend the first paragraph of Article 5, entitled "*Board of Directors*," by striking out, "at its meeting held in Rochester, New York, in 1915, shall elect ten directors to serve one year, ten to serve two years, and ten to serve three years, and thereafter ten directors shall be elected each year to serve for a full term of three years," and insert in lieu thereof the following: "At each annual meeting shall elect ten directors, each to serve for three years"; so that said section shall read:

"*Board of Directors.* The affairs of this Association shall be administered by Board of Directors, consisting of the officers, all ex-presidents, the chairman of each section, and thirty additional directors. The Association at each annual meeting shall elect ten directors, each to serve for three years. In the organization of the Board of Directors representation shall be given as far as practicable to every section of the nations represented in the Association."

Notice was hereby given of a proposed amendment to the by-laws as follows:

Amend Article 5 entitled "*Meetings*"

by striking out the words "time and" and inserting the following sentence after the words Board of Directors "The time of the meeting shall be determined by the Executive Committee"; so that the said section shall read:

"*Meetings.* There shall be at least one set annual meeting of the Association at a place to be fixed by the Board of Directors. The time of the meetings shall be determined by the Executive Committee. Other meetings of the Association may be called by the Board at such times as it seems proper."

The following resolution was presented:

Resolved, That the American Public Health Association expresses its hearty appreciation of and its sincere thanks for the hospitality which has been shown the Association as an official body as well as to its individual members by the Rochester Public Health Association, the city of Rochester, by the Mayor, and the members of the local committees which have arranged the many necessary details which have so greatly facilitated the transaction of business and have contributed so largely to the success of the delightful entertainments which have been provided, for the members and the visiting ladies. Especially does the Association extend to Dr. Montgomery E. Leary, Chairman of the local Arrangements Committee, its most cordial thanks for his untiring efforts in perfecting the arrangements and for his continued solicitude for the members of the Association throughout their stay in Rochester, and that Mr. Garret Smith be also included in these thanks.

The Association thanks the New York State Department of Health and the New York State Sanitary Officers' Association for their coöperation in making possible this great meeting of health officials.

The Association further desires to express its appreciation of the courtesy and efficiency of the press of Rochester and of other cities throughout the country which have given publicity to the proceedings of the Association.

The resolution was unanimously adopted by a rising vote.

The Secretary announced that 443 members had registered, 93 more than at any previous meeting in the Association's history.

The meeting then adjourned.

WILLIAM T. SEDGWICK,
President.

SELSKAR M. GUNN,
Secretary.

REPORT OF THE TREASURER.

Financial Report for Year Ended August 31, 1915.

STATEMENT OF INCOME AND OUTGO.

Income.

	Total.	*Association.**	*Journal.**
Journal Subscriptions	$4,682.35		$4,682.35
Journal Sales of Copies	308.87		308.87
Journal Advertising	2,230.44		2,230.44
Journal Sales of Bound Volumes	24.70		24.70
Association Dues	3,625.00	$3,625.00	
Donations	1,785.00	892.50	892.50
Sales of Water Reports	782.73	782.73	
Sales of Milk and Cream Reports	43.45	43.45	
Sales of Transactions	38.00	38.00	
Miscellaneous Income	66.04	66.04	
Totals	$13,586.58	$5,447.72	$8,138.86

Outgo.

Journal Printing and Mailing	5,185.80		5,185.80
Salaries	3,868.52	1,934.26	1,934.26
Payroll	2,034.51	1,017.26	1,017.25
Stationery and Supplies	402.36	201.18	201.18
Postage	1,063.15	265.79	797.36
Interest	42.01	21.00	21.01
Traveling	190.88	160.62	30.26
Refunds	33.71	18.00	15.71
Miscellaneous Printing	944.01	708.01	236.00
Rent	544.61	272.31	272.30
Discounts	84.49	42.24	42.25
Commissions	68.60		68.60
Convention Expenses—Florida	850.71	850.71	
Convention Expenses—Rochester	250.00	250.00	
Cost of Pamphlets Sold	170.14	170.14	
General Expense	682.39	341.19	341.20
Totals	$16,415.89	$6,252.71	$10,163.18
Loss for Year	$2,829.31	$804.99	$2,024.32

*The figures in these columns are in part estimated. They are only given in order to show the approximate subdivisions of the total income and outgo as between "Association" and "Journal."

AMERICAN PUBLIC HEALTH ASSOCIATION.

Balance Sheet September 1, 1915.

Assets.		Liabilities.	
Cash	$564.36	Due Rumford Printing Company	$2,857.61
Secretary's Fund Cash	19.13	Advertising Contracts Unexpired	41.30
Office Cash	25.00		
Total Cash	$608.49		
Dues Receivable	31.50		
Advertising Accounts Receivable	199.43		
Inventories of Salable Stock	572.17		
Office Equipment	496.84		
Surplus	$1,838.83		
Less Loss for Year	2,829.31		
Net Deficit	990.48		
Total	$2,898.91	Total	$2,898.91

◆

REVACCINATION AGAINST TYPHOID AND PARATYPHOID FEVERS.

Paratyphoid fever is said to be extremely frequent in the various armies in Europe. There has been no severe epidemic of typhoid since the commencement of the war, but from almost the very outset of hostilities, there has been a somewhat wide prevalence of paratyphoid fever. In the *Medical Press*, August 2, 1916, F. Widal and I. Gourmont point out that on account of the extensive prevalence of this disease, Landouzy, as far back as December, 1914, indicated the practice of vaccination as the sole effective prophylactic procedure that could be adopted to fight successfully against this malady and called for a comparative study of the method of successive vaccination against typhoid and paratyphoid fever respectively, and of that of double vaccination carried out by the injection of a mixture of the typhoid and antityphoid bacilli.

In August of last year such tests were made by one of the writers, who concluded that the final choice should be that of a triple vaccine, consisting of a number of typhoid bacilli equal to that contained in the simple antityphoid injection, and a double number of each of the paratyphoid bacilli, A and B. This observer has reported experiments of which the results furnished cogent proof of the powerfully immunizing action of such vaccines when heated; and he has also shown that this vaccine had the effect of making the several specific anti-bodies of each of those microbes appear in the blood of the vaccinated individual and has demonstrated the harmlessness of his procedure. Widal and Gourmont state that they have revaccinated with the triple vaccine about 4,000 persons who had previously been immunized with the simple antityphoid vaccine. Furthermore, they always used the triple vaccine even in the persons who had had typhoid, for the reason that they believed that even in such cases it could not be other than advantageous to profit by the supplementary antityphoid vaccination for the purpose of reinforcing the degree of immunity against the typhoid infection itself. In summarizing their results they assert that the triple vaccine suffices for all the requirements of both antiparatyphoid and antityphoid revaccination. —*Medical Record*, September 9.

ADDENDUM TO "AN ANALYSIS OF APPENDICITIS STATISTICS," BY KNUD STOUMAN, VOL. VI., NO. 7, PP. 714–726.

We beg to make the following addition to the article by Knud Stouman, entitled "An Analysis of Appendicitis Statistics," which appeared in the July issue of the JOURNAL. The table reproduced on the following page, showing the specific death-rates by age from year to year in England and Wales from 1903 to 1913, should have appeared on page 720, second column, before the last paragraph. This table was omitted through an error in the JOURNAL office.

SPECIFIC DEATH-RATES FROM APPENDICITIS BY AGE AND SEX, IN ENGLAND AND WALES, EACH YEAR, 1903–1913.

Males.

Year.	Under 5 yrs.	5–9.	10–14.	15–19.	20–24.	25–34.	35–44.	45–54.	55–64.	65 and over.
1903	12	74	98	99	78	58	47	52	64	67
1904	15	75	106	120	82	63	53	63	61	61
1905	19	70	112	97	81	56	54	61	69	65
1906	31	95	108	123	91	73	63	72	72	38
1907	23	74	101	114	83	64	47	66	71	65
1908	24	99	107	97	82	61	57	70	76	82
1909	35	91	121	102	82	59	62	67	72	74
1910	34	103	117	108	84	60	54	77	91	73
1911	36	130	144	114	102	79	57	90	95	99
1912	30	76	112	98	86	63	54	83	96	95
1913	41	103	109	110	77	61	61	75	77	97

Females.

1903	14	48	50	55	49	40	33	37	50	55
1904	13	55	66	58	52	38	33	37	41	66
1905	15	59	65	65	55	46	41	48	51	62
1906	12	79	81	74	44	38	46	42	53	34
1907	18	62	68	60	49	35	38	38	46	52
1908	21	71	63	62	48	45	40	50	55	61
1909	19	92	78	73	45	45	42	46	69	57
1910	19	89	79	73	54	44	45	56	55	59
1911	28	98	98	66	54	45	46	58	65	78
1912	24	80	72	66	60	43	41	49	60	86
1913	20	85	88	75	55	49	45	65	64	88

Book Review.

Laboratory Guide in General Microbiology. *Prepared by the Laboratory of Bacteriology, Hygiene and Pathology, Michigan Agricultural College. Pp. 418+xvi. John Wiley & Sons, New York, 1916. $2.50, Net.*

This volume, prepared under the direction of Professor Giltner, is the outcome of the labors of the present instructing staff and their predecessors in the microbiological laboratory at East Lansing. In scope the book aims to be "a laboratory guide to general microbiology, leaving the particular field of dairy, soil, water, medical and other phases of bacteriology to special guides already in print or at present projected." His aim is, in a sense, defeated for almost half the book is devoted to specialized studies in the lines which were to be left to "special guides."

The volume is divided into three parts. Part I deals with General Morphological and Cultural Methods; Part II with the Physiology of Microörganisms, and Part III with Applied Microbiology. (Air, Water, and Sewage, Soil, Dairy and Plant Microbiology, and Animal Diseases and Immunity.) The book is therefore not "general" nor is it specialized to the point of thoroughness.

About seventy-five pages of Part I are devoted to the routine preparation of glassware and culture media and to the use of the microscope. The methods described for gelatin and agar are not "Standard" methods, nor is there any insistence on Standard Methods at all. Few teachers can probably afford to spend twenty exercises in covering the ground here taken up, and most of the methods given would seem to be better located with other formulæ in the appendix.

The following 143 pages deal for the most part with actual cultural, morphological or physiological study of microörganisms, and cover an interesting range. The exercises on bacterial nutrition, influence of light and temperature and on enzymes are especially to be commended.

Of the special sections on Applied Microbiology, those dealing with soil and dairy microbiology, are excellent, leading the student to some conclusions and fundamental data. The twenty exercises are in reality long continued experiments, and have been planned with skill and judgment.

To the sections on Air and Water and Sewage less praise can be given. The whole field of sanitary bacteriology is covered in four exercises, one dealing with presumably pure water, one with a polluted water and the other two with disinfection, with bleaching powder and filtration through Berkefeld filters respectively. Such a snap-shot at the examination of drinking water gives the student a false sense of efficiency and no background of established facts. It may be said, however, that the exercises as here outlined have abundant references to special works on the subject.

Plant Microbiology is limited to a single set of experiments, while fourteen well-planned exercises are given to Animal Diseases and Immunity.

An appendix contains an extended outline for the study of microbiology, formulas for special media, solutions and stains, a few useful conversion tables and a list of text and reference books.

The book has undoubtedly been prepared to meet the teaching needs of a single institution and therefore may not meet the requirements of others, but instructors elsewhere may get from it many helpful suggestions.

It is the nearest approach to data to a General Microbiology laboratory guide, and it will undoubtedly be found of great use in many laboratories, where the carefully worked out experiments will be modified to suit the individual instructor.

S. C. Prescott.

Health Department Reports and Notes.

REPORTS.

Richmond, Virginia.

For the past nine years this city of 154,600 population has been showing a steadily decreasing death-rate "especially in connection with those diseases in which the results our work would most clearly appear," and now the Forty-fourth annual report of this health department shows that a number of new records have been established. The general death-rate is 18.89 per 1,000 population against 19.70 for 1914—the first year on record for Richmond with a death-rate below 19.

One of the chief commendable records is the reduction of deaths from typhoid fever. 1915 gave a death-rate of 12.3 per 100,000 inhabitants, against 14.1 in 1914—and with a single slight exception represents the seventh consecutive year with a lower death-rate from this disease. Nineteen deaths were attributed to typhoid, but the records show that six of these decedents (three residents and three non-residents) contracted the disease out of Richmond and that the diagnosis was doubtful in four of the thirteen decedents who contracted the disease in the city. It is interesting to note the change in the comparative death-rate from this disease among the white and colored races since 1909. In that year the typhoid death-rate was 24.1 per 100,000, the white rate being 24.0 the colored 22.8. In 1911, 1912, and 1913 the colored rate continued lower than the white, but in 1914 with a total rate of 14.1 the white rate was only 9.4 to the colored rate of 22.2, and in 1915 the white rate was 6.1 while the colored was 22.9. Further lowering of the typhoid rate must consequently be brought about by giving increased attention to the colored race.

There were no deaths from measles, a condition unequaled since 1905. Malarial fever caused only one death (colored) and there has not been one death from this disease among the white people for three years. There was only one death from scarlet fever. Diphtheria caused six deaths from 312 cases, giving a low death-rate of 3.9 per 100,000 inhabitants, though this is higher than for 1914.

Dr. E. C. Levy, the chief health officer, believes that the most remarkable of all figures for 1915 is the greatly reduced infant mortality rate. There were only 442 deaths in the first year of life, against 509 in 1914. Yet the difference is all the more noticeable in view of the fact that by annexation and natural increase the city's population increased from 134,917 in 1914 to 154,674 in 1915. Thus the rate per 100,000 population in 1915 was 285 while in 1914 it was 378. Doctor Levy has refrained from reporting the infant mortality rate by the usual and most reliable method, *i. e.* rate per 1,000 living births, because he feels that he is not receiving a complete reporting of births; but the rate per 1,000 reported births is 127 against 161 for 1914.

There were 263 deaths from pulmonary tuberculosis, equivalent to a death-rate of 170.0 per 100,000 against a rate of 183.1 for 1914, 108 white and 155 colored. The actual reduction is, in the opinion of Dr. Levy, decidedly greater than the figures show on the surface, since in former years quite a number of deaths actually due to tuberculosis were regularly attributed to other causes, particularly to malaria.

For the fourth consecutive year there was a decided decrease in the death-rate from infantile diarrhea. The number of deaths from this disease was 101 equal to a death-rate of 65.3 per 1,000 population the lowest rate on record for Richmond. The single year 1915 had 52 per cent. fewer deaths from this disease than the annual average rate from 1907 to 1911. This decided and sustained reduction since 1912 is attributed almost entirely to the instruction of the mothers as to how to take care of the excreta of her baby, not only to look out for their stools, but to take proper care in the handling of the diapers, and the Richmond mothers

now are made to realize that human excrement is always very dangerous.

In looking over the comparative mortality of the white and colored races, it is found with "monotonous regularity" that the tremendously greater death-rate among the colored people than among the white is still maintained though somewhat improved. In 1914 the colored death-rate was 82 per cent. higher than the white, with non-resident decedents, both black and white, it was 99 per cent. higher. In 1915 the colored death-rate exceeded the white by 48 per cent., the smallest excess recorded. However it is interesting to note that "so remarkable was the decreased colored death-rate in 1915 that it was but slightly higher than the death-rate for the entire population, white and colored in 1907." The excess death-rate among the negroes seems to be due year after year to tuberculosis and respiratory diseases.

In mentioning the educational and publicity work for the future it is advocated and believed perfectly feasible, to form health leagues throughout the city for the purpose of combating peculiarly local problems—for example, mosquito and fly eradication—and to teach the laws of sanitary science and hygiene.

As in all the reports of Richmond's chief health officer and his subordinates, it is pleasing to note the enthusiasm and thoroughness with which the work throughout the year has been carried on. Space does not permit us to review in detail this report, with its many excellent discussions, particularly on such subjects as skin diphtheria, infant diarrhea and mortality, and the milk question, yet the health men of this country realize the splendid work being accomplished in this city through the health department, and we advise all who can secure a copy of this report to do so, for one cannot but acquire a working knowledge of new methods and theories which have proven their worth.

Changes in the city charter has caused the retirement of the Board of Health and placed the Health Department under an Administrative board. The old Board of Health with Doctor Levy at the helm has made a record during the past ten years of which Richmond may well be proud and set a pace for the new Administrative Board.

"Public Health in East Chicago, Indiana."

Here is a remarkable report. Its title is "Public Health in East Chicago, Indiana," and it is the first report of the department of public health of that city. The report is remarkable for a number of reasons. For one thing, it is a survey, and an excellent survey. It is prepared by Mr. A. W. Hedrich, whose titles are chemist, bacteriologist, and health inspector; Mr. Hedrich is, in fact, with the exception of a girl office assistant, the entire staff of the department.

East Chicago is now a city of about 27,000 population. It has grown very rapidly, having had but 3,700 inhabitants in 1900. The health department expenditures for 1915 amounted to $3,950, about 14 cents per capita. The salary list, which includes members of the Board of Health, totalled only $2,200. Under such circumstances one would think Mr. Hedrich had done very well to quarantine the contagious diseases, make sanitary inspections, analyze samples of milk and water, and examine specimens for laboratory diagnosis of disease. Yet he has not only done these things but has made a careful survey of his city.

The report is comprehensive: it starts with a description of the city and its population, and then discusses the following subjects—preventable deaths, infant mortality, communicable diseases in childhood, typhoid fever, tuberculosis, accidental deaths, milk supply, miscellaneous sanitary factors, and the health department as an organization. It closes with conclusions and recommendations, including a detailed scheme of reorganization. The report covers 42 pages and is effectively illustrated with spot maps, diagrams, and photographs. It reads easily, and the discussion is well-informed.

Infant mortality seems to be the most important public health problem in East Chicago. In 1915 diarrh a and enteritis under two years of age was responsible for 21.5 per cent. of all the deaths occurring, giving a death-rate from this cause of 325 per 100,000 population. The city's infant mortality-rate for 1915 was 160 per

thousand births, the rate showing marked variations among the several wards. The rate among foreigners was almost without exception in excess of that among natives, the figure for one ward being 222. Over half the deaths in the city were among children under two; 44 per cent. were among children under one.

The report makes a convincing argument regarding the seriousness of the present life and health losses in East Chicago and for the improvement of the city's public health service. The Board recommends the appointment of two part-time medical school inspectors, two public health nurses, a food inspector, and a sanitary inspector; and that the department's appropriation be increased to $10,412 to cover these additions. Certainly the department has done its part: it has made excellent use of the meager funds allowed it, and has prepared a report that places the responsibility for the future squarely up to the city and its common council. One hopes that the energetic and intelligent efforts of this zealous health officer and progressive Board of Health will not be wasted, and that the city fathers will not fail to take advantage of the demonstrated opportunity to save each year the lives of scores of men, women and children in East Chicago.

NOTES.

Checking Up Birth Reports.—Since the New Jersey local boards of health are now required to enforce the birth registration law, it becomes a matter of importance to the local health officer to know when violations occur.

It is easy to discover violations in so far as filing late birth reports is concerned, but the difficulty arises in discovering violations by not filing reports at all. The New Jersey State Board of Health, realizing this, in its June *Public Health News* describes, for the benefit of the local health officer, a method of checking which would seem to be most efficient. Briefly the points are:

1. All infant deaths should be checked with birth reports.

2. In smaller communities the local newspaper should be watched for report of births.

3. House to house canvass, at regular intervals, in the sanitary district. This is deemed by far the most accurate method, but few local boards of health have the facilities for making such canvasses.

4. If possible, arrangements should be made for assessors to secure information concerning births during the past year when they make their annual rounds for the purpose of listing property. Birth reports in this way should be quite complete in rural communities.

5. Coöperation of the police force.

6. Coöperation of women's clubs.

7. Coöperation with the school authorities.

8. Examination of baptismal records of churches that practice such.

9. Coöperation of the visiting nurses.

10. Inspection of hospital records which care for sick babies and maternity cases.

11. Checking birth reports of infant-boarding houses, which must be licensed by the board of health. Special care will be required in such places on account of the frequency of illegitimate births.

12. Babies entered in "Better Babies Contests," babies in the records of infant milk stations and consultation stations, should be looked up to see if their births are reported.

The bulletin goes on to say, "Just what may be expected from checking births can be inferred from the registration test made by the Children's Bureau last year, in which they found that 25 per cent. of the births checked in twenty-four states were unreported. In New Jersey 12 per cent. of the births investigated in nine localities were unreported."

*

Age Distributions of Poliomyelitis.—It is frequently remarked that the present outbreak of poliomyelitis represents a virulent form of infection—attention being called to the high mortality rate, approximately 20 per cent. On the other hand, it must not be overlooked that the age distribution of the cases shows that the present infection attacks relatively few older children. Thus, for nearly two thousand cases, the age distribution was as follows:

Age.	No. of Cases.	Per Cent.
Under 1 year	187	10.6
Under 3 years	1,198	67.5
Under 5 year	1,471	83.0
Under 10 years	1,714	97.3
Over 10 years	47	2.7
	1,761	100.0

Judging by the very large diminution in deaths reported from diarrheal disease, in infants under one year, a diminution coincident with the increase in the deaths reported from poliomyelitis, doubt has been expressed as to whether some of the poliomyelitis deaths may not represent cases of mistaken diagnosis. On the other hand, some of the deaths reported in previous years as due to diarrheal disease may, perhaps, have been really due to poliomyelitis infection. A study of all the fatal cases in the present outbreak is now being made in order to shed light on that point; so far it does not indicate that deaths not poliomyelitis have been reported as due to that disease.—*Weekly Bulletin of the New York City Health Department.*

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Infant Mortality and Nationality of Mothers in Chicago.—In a recent bulletin of the Chicago Health Department there appeared, under the above title, the following discussion and table showing infant mortality from diarrheal diseases in 1915 in relation to the place of birth of the mother.

"The U. S. Census classifies population only by country of birth. Thus all Poles are distributed among Germany, Austria and Russia. Therefore no Poles appear in its classification. The school census of 1914 accepted the statements of the families and shows a large number of Poles, who preferred to be so classified. Others, no doubt, preferred to be classed under their legal sovereigns. The classification as to Slavic or Germanic nationality is, therefore, only approximately correct.

"By comparing the percentage of deaths and the percentage of total population, the relative mortality of babies, whose mothers were American or foreign-born, is readily seen. Thus the American-born constitute 64.1 per cent. of the total population, while the babies of the American-born suffered only 25.39 per cent. of the total mortality.

"The mortality of babies of the foreign-born varied widely. Compared with a similar tabulation made in 1910, it is apparent that Chicago became increasingly 'foreign-born' between 1910 and 1914. And this increase was limited largely to the Slavic peoples and the Italians. The Germanic stock decreased from 10.6 to 9.6 per cent. of the total population.

"These figures indicate where instruction of mothers and improved sanitary conditions are most urgent.

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Diarrheal Disease Deaths Among Children under Two Years of Age During the Year 1915 in Relation to Nationality of Mothers.

Mothers Born in:	Deaths from Diarrheal Diseases.	Per Cent. of Total.	‡Per Cent. of Each Nationality to Total Population.
Poland	540	20.58	5.1
Bohemia	85	3.24	2.0
Hungary	72	2.74	0.9
*Russia	230	8.76	4.1
Lithuania	12	0.45	0.7
†Other Slavic Countries	8	0.30	0.2
Total Slavic	947	36.10	13.0
Germany	121	4.61	7.8
Austria	538	20.51	1.4
Other Germanic countries	11	0.42	0.4
Total Germanic	670	25.54	9.6
Total Scandinavian	33	1.25	4.3
Italy	174	6.63	2.4
Ireland	39	1.48	2.8
All other foreign-born	27	1.03	3.7
Total foreign	1890	72.05	35.9
United States	666	25.39	64.1
Unknown nationality	67	2.55	...
Grand total	2623	100.00	100.0

* Includes Finland.
† Includes Croatia and Servia.
‡ From School Census, 1914."

✻

Illinois Health Officials Urge Community Coöperation.—In discussing the problems of the smaller Illinois community, the State Board of Health in its June *Health News* urges the adoption of proper laws by the legislature so that health coöperation between the smaller districts should be made possible. The bulletin goes on as follows:

"If the laws of the state would permit, it would be a much better plan for the adjoining villages to unite on a health officer who could

devote all his time to this work alone, being paid a reasonable salary and not being handicapped by any outside or private business. Very few physicians in private practice are fully competent to do all the work which comes directly under a health officer's supervision, or, if competent, have not the time to devote to it in the way in which it should be done. Not only is it necessary for him to be acquainted with contagious diseases, their diagnosis, means by which they are spread, etc., but he should be able to make bacterial examinations, analyze water, milk, etc. In addition, he must know about plumbing, water supply, housing conditions and other sanitary affairs, such as disposal of garbage and refuse. The work of a public health officer has really become a specialty in itself and if sufficient salary is offered, good men will take up the work. In the end, it would be a matter of economy, as many epidemics of contagious diseases could be prevented and better community health, always a valuable asset, be obtained. To put it on cold grounds, every death in a community is a direct, monetary loss and when this death is due to a contagious, preventable disease, such as typhoid fever, is a disgrace to the community where the disease is contracted.

"If it is impossible, under existing laws, for smaller communities to unite as suggested, the question should be so agitated that the legislature would be forced to take such action as to make it possible and even obligatory. And not until something of this kind can be done will there be anything like adequate care taken of the health of communities at large. It is a well-known fact that no definite action can be obtained from any legislative body until public sentiment is so aroused regarding such action that they are obliged to take notice and this has been particularly true regarding matters of public health. The time is now ripe for forcing the attention of our lawmakers to these necessary reforms and all these things should be constantly agitated until the general public is thoroughly waked up and then, and then only, can proper laws be obtained."

*

Important Public Health Legislation in Mississippi.—Two important bills, prepared and advocated by the Mississippi State Board of Health, were passed at the 1916 legislature of that state. The first is the establishment of a sanitarium for the care and treatment of tubercular patients, not only for treatment of the cases, but also the education of the tuberculous population of the state. The second bill passed deals with the prevention of blindness, particularly in respect to the reporting of "inflammation of the eyes of the new-born" and the administration of prompt and effective prophylactic measures.

The two bills are given in full in the June *Health Bulletin* of the state board of health. Section 5 of the bill creating a state tuberculosis sanitarium is particularly worthy of note. It reads as follows:

"Section 5. Said Bureau for Tuberculosis shall operate and maintain a correspondence school with those suffering from tuberculosis in this State, to the end that the tuberculous population of Mississippi shall be properly advised and directed both as to the methods for attaining cures and as to the methods for preventing the spread of disease to other persons."

*

"Motion Pictures in a Public Health Campaign.—The first spell of hot weather is the time for municipal authorities to begin their public health campaigns. And the most effective medium is the motion picture. I need only refer to some of the results achieved in this connection to suggest ways and means.

"As is perhaps logical, New York City has taken the lead. The first step in the 'clean-up' campaign, for which Commissioner Goldwater was responsible, was arranging with over eight hundred exhibitors to show advance slides in their theaters. These slides drew attention to such subject as flies, typhoid fever and care of the baby.

"This was followed by twenty free motion picture shows in the parks and on the recreation piers of the metropolis. The program in each case consisted of four reels of the sugar-coated kind, bearing the following titles: 'The Story of a Consumptive,' 'The Production and Handling of Milk,' 'The City Beautiful' and 'The Little Cripple.' Judging from the interest manifested by spectators, the stories got across sure enough.

"Boston, too, inaugurated a campaign along similar lines, with this exception—the programs were not confined to health films. The other subjects shown were current news pictorials, refined comedies and animated cartoons. These

programs drew increased audiences, the average nightly attendance being from 8,000 to 10,000. The exhibitions were arranged by the Committee on Park Shows.

"St. Louis has adopted the plan for two successive seasons. Each park playground was equipped with a portable projection booth and a portable screen, the gas-pipe frames making it possible to construct the latter with practically no delay. The screen was placed fifty-four feet away from the front row of seats, but this space was not wasted, as it came in handy to accommodate children on busy nights. The mixed programs appealed especially to the foreign element, who, for lack of funds, prefer to spend their evenings in stuffy tenements. The performances began at 7.45 and closed about two hours later.

"These free open-air exhibitions, I regret to say, are apt to antagonize the average exhibitor. Such was the result at first, both in Cincinnati and in Nashville, but instead of taking patrons away, the free shows actually produced extra business, converting, as they did, many folk to the movie habit. It is a regrettable fact that the two forms of entertainment come in conflict, for those to whom a dime is nothing will favor the regular show, and consequently the health pictures fail to reach so many people.

"It would not be worth while to hold the exhibitions during the morning or afternoon, since the majority of the population are then otherwise occupied. Perhaps more satisfaction could be obtained were the coöperation of the local exhibitors sought. I know of a showman in Marshville, N. C., who, of his own initiative, set aside one night weekly during the summer for the showing of health pictures. These included the following subjects: 'The Mosquito,' 'The War on the Mosquito,' 'The Fly Pest,' 'Life in Our Ponds" and "Boil Your Water." I am certain that it would not be hard to prevail upon the exhibitor to do this, especially when he is shown that he would thus be assisting the community; and even were he not thus disposed, perhaps he would consent to run an occasional picture of this kind on his regular program.

"What stands in the way of the widespread adoption of this medium is the scarcity of suitable available subjects, but even this fact need not deter one from carrying out the plan. One can have a film produced along the desired lines. The Massachusetts State Board of Health, for instance, has had two films produced, the stories of which relate to unhealthful living in its chief forms and its harmful effects. The photoplays are entitled 'Bringing It Home' and 'In His Father's Footsteps.' I understand that the Health Board is prepared to lend these productions and to supply a competent lecturer without charge to any organization requiring the service.

"You cannot interest children in health and sanitation by the lecture or the literature routes, but show them a film on the subject and they will readily understand what you are driving at."—Ernest A. Dench, in the August *American City*.

*

Glanders Diminishing.—The following summary showing the number of cases of glanders in horses reported to the New York City Department of Health is encouraging evidence of the success achieved by the administrative measures enforced by that department during the year. These measures embraced the sanitary control of all stables in the city, the closing of public horse troughs, the making of specific diagnostic tests for glanders of all horses exposed to a proved case of glanders, the destruction of all reacting animals, the supervision of all horseshoeing establishments, and the distribution of circulars of information on glanders to all horse owners, stable keepers, horse shoers, etc.

It will be noted that the reduction in the number of cases of glanders reported is progressive and averages nearly 50% in the last two quarters:

CASES OF GLANDERS IN HORSES IN NEW YORK CITY.

	1914.	1915.	1916.
First quarter	229	232	127
Second quarter	313	161	82
Third quarter	227	145	..
Fourth quarter	384	166	..
Totals	1,153	704	209

Public Health Notes.

The Medical Care of Children.—It has long been observed that "one of the most important factors which militates against the success of any educational system is the physical inability of the children to take full advantage of the facilities for education which are placed before them.

"The causes of this social and economic loss," says Dr. Franklin W. Bock in *American Medicine* for July, are "largely medical, using the term in its broadest sense, and if the problems of community efficiency are ever to be solved the medical profession must put its mind to the test of devising some plan of medical effort which will prevent and counteract the ill effects of these physical handicaps in our children."

The most recent medical efforts have been directed towards compulsory medical school inspection and this policy "irresistibly bringing us to the point where more or less pressure will be put upon parents in our insistence that physical defects and disability be immediately remedied if possible."

While private philanthropy has in some measure endeavored to provide this means, such work has been confined to so called charity cases. Doctor Bock believes that this is an "illogical and unrighteous principle which makes our children objects of charity. They are our best asset and whether they are of well to do or of poor parents the community owes them the opportunity of living healthful lives if possible."

A number of cities he declares are well on the road to complete socialization of the medical care of children. Toronto, Canada he points out as a community showing the way to the full realization of the logical ideal of medical work for children. She has fifteen dentists in her public schools, paid by the city, under the control of the city, and they give dental care to every child in Toronto who needs it irrespective of the financial standing of the parents. Last year they gave full dental treatment to 6,000 children, and in four years they have reduced the dental necessity in the public schools from 95 per cent. to 65 per cent.

"Toronto has given us the first example of the full realization of the ideal in medical work for children.

"This ideal is four fold.

"First—Under municipal control.

"Second—Financed by the city at large.

"Third—Service given to *all* children.

"Fourth—Clinical units established where the work can be done most efficiently and with the least wasteful expenditure of the time and energy of the children, the school authorities and the parents; namely in the school buildings."

Doctor Bock believes that

"A work of this kind organized in sympathetic coöperation with the health and school authorities would undoubtedly result in a great reduction in our infant mortality and in a greatly increased health and mental standard for the children of the city, and at the same time it would gradually but surely put our children's hospitals out of business."

*

A Safe and Sane Fourth.—In 1903 the *Journal* began the collection of statistics regarding deaths and injuries resulting from the use of fireworks in the celebration of the Fourth of July, and for fourteen years has fought for a betterment of conditions. In addition to securing data through news-clipping bureaus, blanks were sent to physicians, health officers and hospitals, requesting lists of casualties. From the beginning special efforts were made to obtain information as to cases of tetanus resulting from these injuries. The tabulated figures of injuries and the enormous proportion of deaths from lockjaw in that first year were appalling. In the 1903 report it was shown that 4,449 persons had been injured, and that 466 had died. Of those injured, many had lost their sight, had legs, arms or hands blown off, or were otherwise mutilated for life. Of those fatally injured, 406, mostly children, died from tetanus, or lockjaw. In the report particular attention was called to the fact that the great majority of lockjaw cases had resulted from blank cartridge injuries, and prohibition of their use was urged. Special directions were also given regarding the care of all blank cartridge and other puncture wounds, and the early use of tetanus antitoxin as a prophylactic was strongly advocated. Reprints

of the report were circulated, but not to so great an extent as was done a few years later.

In the following year a gratifying improvment was noted in the reduction of deaths from tetanus —ninety-one instead of 406. Little or no attention was at first paid to the statistics. In spite of the annual publication of the awful results year after year, the number of casualties continued to increase, until in 1908 there were 5,623 accidents, and in 1909 there were 215 deaths, 125 of which were from lockjaw.

In 1908, however, in addition to the statistics previously presented, a table was prepared, giving the casualties in eighty-four of the largest cities. This showed that the majority of deaths and injuries were clearly due to the lawlessness and disorder permitted in these cities. The corollary was also clear that the city governments were responsible, since the annual carnage could be prevented only by restrictive ordinances. The pamphlet containing a reprint of the report of 1908 was sent to newspapers throughout the country. The response was remarkable. The press generally quoted the *Journal's* statistics, naturally emphasizing the figures for the local city and state. The facts touched local pride. Civic and other organizations started campaigns for the suppression of fireworks and the encouragement of a more enlightened celebration. City officials were stimulated to action, and in a single year a remarkable diminution of injuries resulted. That progress, with slight fluctuations, has continued, until this year not a single case of lockjaw resulted from the celebration, and there were less than one-fifth as many injuries as were reported in 1909.

It was a foregone conclusion that, once the public was acquainted with the facts, a change would be demanded. It is apparent that "a safe and sane" celebration of our independence will soon become so widespread that there will be neither injuries nor deaths from this needless cause.—*Journal of the American Medical Association.*

✠

The Sanitation of Railway Cars.—Dr. Thomas R. Crowder presents a splendid summary of our present knowledge of the sanitation of railway cars in the United States Public Health Reports of August 11, 1916. There is so much known about this subject which is "not so" that it is refreshing to come across an authoritative statement of our present knowledge in this important field. Most of the literature on the subject contains little of the exact scientific knowledge on which efficient practice must be based.

Doctor Crowder points out that infection in occupied places may be contracted in three ways:

"(1) By direct transmission from person to person through the agency of mouth spray and intimate personal contact; (2) by indirect transmission through food and drink and from the common use of utensils or other facilities for comfort and convenience; and, (3) from infected premises. So far as railway cars are concerned the first of these is the most important. With the exception of a few diseases which are generally conveyed through food and drink, such as typhoid fever, the accumulating evidence of recent years is making it more and more clear that the majority of transmissible infections are passed with relative directness from person to person. We are coming to understand that people, and not things, are the chief agents of disease transmission as well as the sources of infection; that the thing that counts is the actual presence of the infected person."

One of the most serious diseases to which travelers are exposed is pulmonary tuberculosis. Direct transmission through the medium of mouth spray is probably one of the most frequent and important ways of contracting the disease. Railroads, however cannot deny the tuberculous transportation while they are permitted the freedom of all other places, public and private. The problem becomes therefore mainly personal. The common drinking cup, the common towel, comb and brush should be abolished.

Doctor Crowder believes that

"Ample provision should be made in all railway cars for travelers to keep their hands and faces clean. Lavatories should be conveniently located, supplied with an abundance of water, well drained and trapped, and should have smooth surfaces for easy cleaning. Towels should be constantly at hand and in sufficient quantity for individual use. There should be a place for brushing the teeth—a dental lavatory —in all cars which make long journeys. Using a wash basin for this purpose is to make a cuspidor of it.

"Toilets should be always available, well flushed, perfectly emptying, and capable of easy cleaning. The old type of open hopper, with its updraft of wind and dust and its nearly constant fouling, is disagreeable, and passengers avoid its use, to the detriment of health.

"The fallacious drip machine—the so-called continuous toilet disinfector—should be mentioned only to be condemned. It does not disinfect; it only distils an odor, sometimes worse than the one it tries to hide, and diverts attention from conditions that need mending.

"In the dining-car we meet the most important of the problems of indirect transmission of disease. Many of the infections may be contracted through the medium of food and drink, and some of them, as typhoid fever, are commonly transmitted in this way. Cleanliness in the preparation and handling of food is therefore all important to the public health. Especially milk and cream and vegetables to be eaten raw must be produced and stored in such a way as to avoid contamination. But more important still is the supervision of the health of dining-car employees to the end that those harboring transmissible infections may be excluded from the service. Periodic examination of cooks and waiters should be made at frequent intervals, certainly not longer than quarterly or half yearly, and those found infected with tuberculosis, venereal diseases, typhoid fever, diphtheria, etc., should be dismissed until complete recovery has taken place."

Very little experimental work has been done on the bacteriology of the railway coach. The work Kinyoun carried on many years ago showed that while there were various pathogens in the dust from the floors and furnishings of cars only a few of them retained their virulence and these in a small degree.

"It is nevertheless desirable that the railroads should take precautions to keep car infection down to a minimum. This may be done in two ways: By mechanical cleaning, which removes the bacteria; or by fumigation, which kills them. Of the two methods, the former is much the more important. Mechanical cleaning will not remove all the bacteria, for it can not remove the last particle of dust or dirt in which they are contained; but if it is well done, not enough will remain to be of any danger to passengers who use the car.

"Ventilation is an always vital sanitary problem. Good air is of prime importance to good health. Ten or twelve years ago attempts to supply good air to railway cars were generally failures. The problem seemed complicated and almost hopeless. It still has its difficult points, but thanks to the enlightening research of the last ten years it is now much simplified. We have learned what good air is: It is air that bears a proper thermic relation to the body. It must be able to absorb the body heat as rapidly as formed, without being cold enough to produce discomfort. It must be warm, but not too warm; it must have motion, but not enough to cause a chilling draft; it must be changed constantly to prevent stagnation and overheating. When these conditions, which are purely physical, are complied with, practically all other things may be left out of consideration. The chemical changes brought about by respiration are ordinarily negligible.

"As yet we do not know the whole hygienic significance of track pollution. It should be studied with care. Two things may conceivably bring danger—either discharges may be washed from the tracks into bodies of water which are used for domestic supply, or they may dry, become pulverized, be blown up as dust by the wind or passing trains, scattered to the neighborhood, or blown into passing cars. Our knowledge is now sufficient to assure us that the first of these dangers is real, and that where track drainage is into domestic reservoirs the protection of the reservoirs is demanded. While it is well known that bacteria are rapidly destroyed in running streams, the drainage from tracks may be much too direct for such action to take place, and where reservoirs are near the lines the drainage must be so arranged that contamination of the water supply will not occur."

⚜

Should Notification, Quarantine and Terminal Fumigation Be Required in Chicken-Pox, Mumps and German Measles?—In March, 1914, the public health council of New York adopted certain sanitary regulations. During the winter of 1915 some criticism was directed at the regulations with the result that an investigation was carried out and a questionnaire sent to eighteen prominent physicians and health officers. The answers received showed marked agreement.

The following conclusions were established.

It would seem to be of great importance to require the reporting of all three of these diseases if any attempt is to be made to control them and abolish them.

Chicken-pox is not infrequently confused with smallpox and is a very contagious disease, and as it occasionally has severe complications it should be controlled, not only from the danger of its being confused with smallpox but also because it may be a serious disease itself.

German measles requires no further control, except that it should be reportable and diagnosis should be confirmed by experts in order to prevent confusion with scarlet fever.

Mumps may be a more serious disease than is supposed and should for this reason be reported. Physicians and health officials too often forget that communicable diseases which are mild in a healthy, well-cared for child, may be a serious factor in the life of a child weakened from malnutrition or improper care.

✻

Poliomyelitis vs. Other Infectious Diseases.—Great catastrophes teach great lessons, and the greater the catastrophe the more impressive the lesson. Immediately after a disastrous railroad accident, a shipwreck or a sensational fire, in which lives are lost, action is always taken to safeguard the public against such particular incidents in the future. But a broad application of the lesson is seldom, if ever, made. The lesson of the Slocum fire, with its frightful loss of life, was applied only to safeguarding against a repetition of an identical occurrence in the future; the conditions which caused the disaster of the Eastland, for instance, were not anticipated. The sudden development of the present epidemic of poliomyelitis with its mortality and its train of crippled children has awakened special interest in this disease: all over the country boards of health are realizing their responsibility in regard to it. But it must not be forgotten that this particular epidemic is infinitesimal as compared, either in number or in total mortality, with the old enemies that are always with us. We are reminded of this by the *Survey*, which calls attention to the fact that during May, June and July there were 3,205 cases of poliomyelitis in Greater New York, while during the same period there were 9,710 cases of measles. The latter, like vice, is with us always, and we have become accustomed to it. And yet the total mortality over an extended period from this disease, is far greater than that from poliomyelitis. Diphtheria, scarlet fever and the ever-present tuberculosis are today hardly given consideration; yet the total mortality from any of these diseases is infinitely greater than that from poliomyelitis, including epidemics. We are apt to forget that the latter disease is always with us, and that the present occurrence is merely a "flare-up," just as we have similar exacerbations of the other acute infectious diseases.—*Journal of the American Medical Association.*

✻

Syphilis—Some of Its Public Health Aspects.—"Whatever the causes and whether or not on the increase, luetic infection presents the greatest of all the sanitary problems which confront the modern world," writes Dr. L. L. Williams in the United States Public Health Reports for August 4, 1916.

Among the circumstances which render the problem of syphilis of such extreme gravity may be mentioned:

(*a*) The difficulty in obtaining data of its incidence.

(*b*) The stigma attaching to the disease rendering notification and prompt treatment difficult.

(*c*) The extent to which it permeates all civilized communities and all strata of society.

(*d*) Popular ignorance of the great gravity of the disease; few people know anything about the remote consequences.

(*e*) Extreme chronicity and difficulty of permanent cure.

(*f*) Frequency and gravity of late manifestations, especially lesions of nervous and cardiovascular systems, affecting many otherwise valuable members of the community while at the height of their economic usefulness.

(*g*) The large numbers of sufferers innocently infected in the marital relation and otherwise.

(*h*) The effect in diminishing the birth-rate.

(*i*) The effects upon the progeny of syphilitic persons in case of survival after birth.

(*j*) Probable late degeneracy among descendants of syphilitics.

The discovery of the treponema by Schaudinn,

of salvarsan by Ehrlich, and of the blood tests of Wassermann have given the sanitarian instruments by which to meet this great problem. Some of the possible applications of these discoveries may be, says Dr. Williams: 1. In the regulation of marriage. This is admittedly a very difficult question and most of the regulations in this direction are crude and difficult of execution. 2. As preliminary to life insurance. This method holds out considerable promise. Thus, Dr. Williams suggests a lower premium be offered to policy holders who demonstrate a negative Wassermann. 3. As preliminary to entrance into government service. The United States Public Health service has recently insisted on Wassermann tests for candidates for a commission. This is a valuable lesson to the public. 4. As a general compulsory method in military and naval circles, in penitentiaries and reformatories. 5. As an optional method. It may be applied as an option in higher schools, training camps, factories, etc. 6. As preliminary to employment in certain large corporations.

Doctor Williams concludes that

"The suggestions for partial control which have been advanced are those which now seem possible of adoption in practice. To insist upon ideal methods would probably result in failure; practical difficulties militating against the adoption of procedures which intrinsically may be of great value must be reckoned with, and all measures calculated to offend the sensibilities of the public avoided in so far as may be practicable. In other words, more progress will be made in the end by gaining the confidence and arousing the interest of the public, and thereby enlisting their coöperation, than by causing widespread antagonism in the prosecution of an ideally satisfactory campaign for suppression. In the case of the ordinary communicable diseases, like typhoid fever and tuberculosis, the problem is much simpler, yet progress is slow and well-established measures of control are tardily accepted.

"In dealing with the problem of syphilis, on the other hand, we encounter not only ignorance but also a formidable array of erroneous fixed ideas and deeply rooted prejudices which can not be presently eradicated by the mere marshaling of scientific facts, no matter how cogently presented. Much tact, therefore, will be needed and much restraint must be exercised lest we seriously damage the cause we are advocating by urging radical reforms for which the public is not yet prepared."

✽

Tubercular Infection in Infancy and Childhood.—In December, 1913, the bulletin of the Massachusetts Trustees of hospitals for consumption stated that "the importance of childhood infection is coming to be recognized as a most important factor in the anti-tuberculosis work." This statement summarizes the present day attitude of sanitarians towards this great problem. An excellent article covering the latest work in this direction appears in the Boston *Medical and Surgical Journal* for August 17, by Dr. Vanderpool Adriance. The following summary gives at a glance the conclusions drawn from this study:

1. A positive von Pirquet reaction is a proof of tubercular infection.

2. Tuberculosis in the adult is the result of a song begun in the cradle.

3. Tuberculosis is largely contracted in the home circle.

4. The number of children infected increases with the years of age.

5. A von Pirquet reaction during the first two years of life signifies a bad prognosis, but the mortality decreases as the years advance.

6. Infection with small doses of the germs at infrequent intervals may gradually establish immunity.

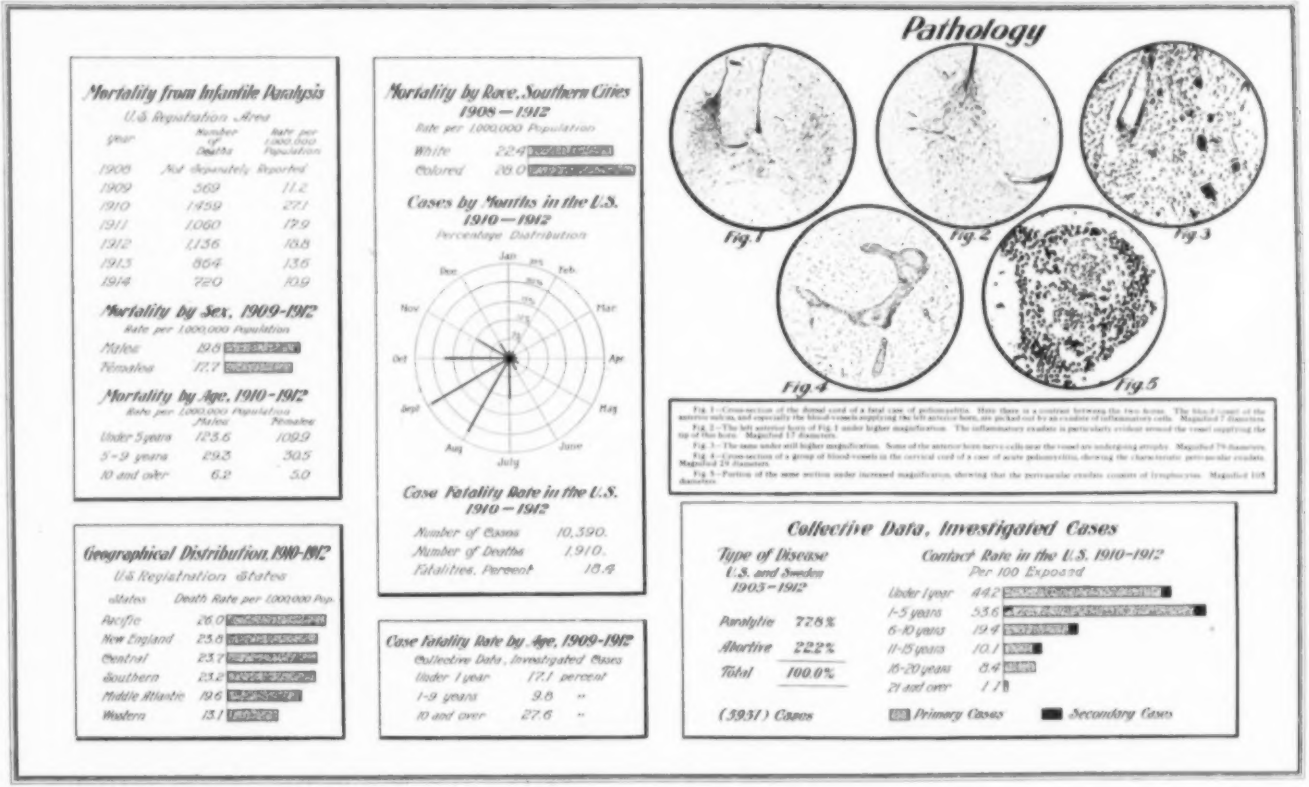
7. Infection with the bovine type of tuberculosis occurs mostly in infancy and childhood, while the human type is chiefly manifested in adult life.

8. The bovine type manifests itself chiefly in disease of the bones and lymph glands of the neck and mesentery.

9. There is a possibility that the milk of immunized cows may be useful in the prevention and treatment of tuberculosis in the human.

10. Pasteurization of milk should be generally adopted.

American Public Health——Infantile Paralysis



Original Tabulation by The Prudential Insurance Company of America.

The pathological illustrations are from Dr. Mervyn Gordon's "Report on Acute Poliomyelitis," Local Government Medical Report, London, 1912.

Industrial Hygiene and Sanitation.

Compensation Bill for Government Employees Now a Law.—The Kern-McGillicudy bill providing compensation for civilian employees of the federal government who are injured while at work, and adequate compensation for their families in case of death of the employees, was passed by the senate on August 20.

The bill, in the case of permanent total disability of an employee, would grant a pension of 66⅔ per cent. of his salary during life. In the case of temporary total disability the bill would grant 66⅔ per cent. of the loss in earning capacity to the employee. In the case of temporary partial disability the bill would grant to the employee 66⅔ per cent. of loss in earning capacity.

In the event of the death of an employee while on duty the bill grants from 20 to 66⅔ per cent. of the salary of the employee, according to the number of dependents of the employee. This aid continues until the widow dies or remarries and until the children are sixteen years old.

Provision is made in the bill for medical attendance of injured employees. It is believed that such provision will prevent protracted compensation payments. Compensation is to be paid to the employee injured after a period of waiting of three days.

*

Health Insurance and Degenerative Diseases.—A check upon the increase in degenerative diseases among wage-earners in middle life is found in universal health insurance. Health insurance, it is pointed out in a brief just published in New York by the American Association for Labor Legislation in support of this important piece of social legislation, will bring medical care within the reach of large numbers who are unable to afford this luxury on the present basis of payment. This number, it is estimated, reaches 25 per cent. of the population in a city like Boston. Under health insurance medical care will be paid for in advance on an insurance basis, calling for small weekly contributions. These altered conditions, far from deterring the wage-earner from consulting his physician, when suspicious symptoms appear, will actually encourage him to seek medical advice. Moreover, these examinations, unlike "physical examinations" for employees as they are conducted today, will result in treatment and continued observation until the sick workman is able to return to work. Aside from this voluntary action of the patient, a periodic physical examination may be developed as one of the regular activities of the democratically controlled health insurance funds. In either case the increased opportunity for early diagnosis, coupled with treatment, may be expected to check the increasing mortality from cancer and degenerative diseases until the average prolongation of life may be as great here as in Prussia, where, under a system of health insurance, there has been a decline instead of an increase in the mortality rates of middle life. Health insurance is a promising weapon with which to fight the premature appearance of the diseases of adult life.

*

Social Workers Engaged in Mining Camps.—Women trained along medical, social and domestic lines, have been engaged for sociological work in the coal and iron mining camps and the steel plant of the Colorado Fuel and Iron Company.

Dispensary and visiting nurse work will be performed, supplementing the activities of the camp physician and the regular medical department. The nurses will be available whenever needed for illness or emergency operations. They also will visit homes and advise the women on hygiene housekeeping and sanitation.

*

Six European Nations Now Have Health Insurance for Workers.—In the five years before the present war not less than six European countries adopted compulsory health insurance for wage earners. Thus, populations, totaling some 230,000,000 and including such widely different people as Russians and Dutch, British and Roumanians, Norwegians and Serbs, legislated for health insurance after having seen it in operation in Germany, Austria, Hungary and Luxemburg. State support is also given to health insurance for workers in France, Sweden, Denmark and Switzerland.

These striking facts are made plain in the summer number of the *American Labor Legislation Review*, published by the American Association for Labor Legislation, in which, for the first time in this country is presented a health insurance map of Europe, with a carefully drafted bill for American legislation and an elaborate brief in its support. The map shows that in the course of a few years this new type of social legislation has spread to every civilized, industrial country in the Old World, with a few exceptions, and there are indications that Canada will adopt a similar system at the conclusion of the war.

⁂

Pennsylvania Sets Pace in Safety Work.—The industrial board of the State Department of Labor and Industries in Pennsylvania has adopted complete working codes of safety standards for the thousands of workers in the textile and electrical industries of the state.

⁂

Safety Subways.—Large tunnels, permitting the ingress and egress of employees without danger of accident, are being installed in the McDonald Mills at Youngstown, Ohio.

Compulsory Health Insurance in Canada.—Compulsory health insurance for wage-earners, which is now being strongly advocated in this country, is pretty certain to be given a further boost by the adoption of the measure as a plank in the platform of the National Liberal party of Canada, led by Sir Wilfred Laurier.

The new Canadian plan includes maternity benefits. There is considerable expectation that the Conservative party will follow the Liberal lead and that legislation will follow soon after the war.

⁂

Homes for Munition Workers.—To care for the thousands of men who have come to work in the munition factories, the Bridgeport Chamber of Commerce has organized the Bridgeport Housing Company, with a capital of $1,000,000, to build homes for workingmen.

⁂

Warning Against Eye Injuries.—A report recently issued by the Massachusetts State Board of Labor and Industries is authority for the statement that more than 6,000 injuries to the eyes have been reported in the state during the past year.

Personal Notes.

Dr. Donald B. Armstrong has resigned as Director of the Department of Social Welfare of the New York Association for Improving the Condition of the Poor, to become Assistant Secretary and Director of the community tuberculosis experiment of the National Association for the Study and Prevention of Tuberculosis.

⁂

Mr. W. E. Brown has resigned from the United States Public Health Service to accept a position in the acoustical department of the H. W. Johns-Manville Company of New York City.

⁂

Dr. J. Howard Beard of Urbana, Ill., has been appointed health officer of the University of Illinois.

⁂

The following persons were elected to membership in the American Public Health Association:

J. G. Schmidlapp, Cincinnati, Ohio.

Joseph C. Beck, M. D., Chicago, Ill., Physician and Surgeon.

A. J. Lanza, M. D., Butte, Montana, Passed Assistant Surg. U. S. P. H. Service.

Hugo Mueller, M. D., Madison, Wis., Physician, County Health Officer.

Wm. K. Murray, M. D., Chicago, Ill., Physician.

Jacob D. Brook, M. D., Grandville, Mich., Health Officer.

D. W. Crankshaw, M. D., Lawrence, Mich., Village Health Officer.

John R. Hume, M. D., Ph. D., Doniphan, Mo., Physician and Surgeon.

Catherine H. Travis, M. D., Hampton, N. B.

Albert P. O'Leary, M. D., Bigtimber, Mont., Physician.

Henry McC. Burnham, M. D., Moss Point, Miss., Physician and County Health Officer

Thomas J. Carney, M. D., Alma, Mich., Physician and City Health Officer.

Courtenay Dinwiddie, Cincinnati, Ohio, Superintendent Cincinnati Anti-tuberculosis League.

T. Eben Reeks, New Britain, Conn., City Superintendent of Health.

Abel Wolman, Baltimore, Md., Sanitary Engineer.

George A. Blaylock, M. D., Physician and Surgeon, County Health Officer, Perryville, Mo.

John A. Gosling, M. D., Tiffin, Ohio, Physician and City Health Officer.

L. H. Thompson, M. D., Cincinnati, Ohio, Marine Hospital, U. S. P. H. Service.

Dorothy Child, M. D., Philadelphia, Pa., Assistant Secretary Pennsylvania Society for the Prevention of Tuberculosis.

Joseph D. Halliday, Cleveland, Ohio, Chief, Bureau of Education, Health Department of Cleveland.

Truman C. Terrell, M. D., Fort Worth, Texas, Physician, Practice limited to Bacteriology and Pathology.

Current Public Health Literature.

AMERICAN.

Albany Medical Annals.

XXXVII. August.

Should Notification, Quarantine, and Terminal Fumigation be Required in Chickenpox, Mumps, and German Measles? L. R. Williams.

Systemic Infections through the Oral Cavity. J. H. Collins.

American Journal of Clinical Medicine, Chicago.

MCMXVI. July.

Alcohol: Its Influence Upon Mind and Body. Bowers.

Vaccine and Serum Therapy in Everyday Practice. Wolverton.

August.

Vaccine and Serum Therapy in Everyday Practice. Wolverton.

American Journal of Diseases of Children, Chicago.

12. August.

Observations Upon the Tendency of the Diphtheria Bacillus to Localize in the Upper Respiratory Tract. The Importance of this Fact in Routine Culture Work. D. O. Walthall.

Infantile Scurvy, III. Its Influence on Growth. A. F. Hess.

Résumé on Infectious Diseases. A. H. Beifeld.

American Journal of Sociology, Chicago.

XXII. July.

Social Devices for Impelling Women to Bear and Rear Children. Leta S. Hollingworth.

Youthful Offenders: A Comparative Study of Two Groups, Each of 1,000 Young Recidivists.

The Organization of Effort. E. A. Ross.

Trade Unions and Efficiency. O. Tead.

Exemption as a Principle of Social Justice. J. H. Underwood.

The Puritan and His Indian Ward. L. M. Sears.

Boston Medical and Surgical Journal.

CLXXV. August 10.

Asthma in Children, II. Its Relation to Anaphylaxis. F. B. Talbot.

Preparation of Vegetable Food Proteins for Anaphylactic Tests. E. A. Tracy.

Hay-Fever: Its Treatment with Autogenous Vaccines and Pollen Extract. L. S. Medalia.

August 17.

Tuberculosis Infection in Infancy and Childhood. V. Adriance.

The Massachusetts Tuberculosis Dispensaries and Their Relation to the Practising Physician. J. S. Hitchcock.

A Year's Work of a Local Tuberculosis Hospital. A. C. Getchell.

A Suggestion as to the Prevalence of Infantile Paralysis. W. S. Whittemore.

August 24.

Hygiene of the Mind. B. J. Croft.

Mental Preparedness. J. J. Putnam.

The Meaning of the Mental Hygiene Movement. W. A. White.

The Menace of Mental Deficiency from the Standpoint of Heredity. H. H. Goddard.

The Functions of Social Service in State Hospitals. H. Curtis.

American Medicine, New York.

XI. July.

Communicability of Poliomyelitis. Ira S. Wile.

Medical Care of Children. F. W. Bock.

Interstate Medical Journal, St. Louis.

XXIII. August.

Syphilis and Trauma. W. P. Coues.

The Atypical Primary Lesion in the Early Diagnosis of Syphilis. J. H. Stokes.

A Review of the Histological Lesions of Syphilis of the Nervous System. S. T. Orton.

How Shall Latent Syphilis Be Treated. H. C. Solomon.

The Control of Syphilis. Isadore Dyer.

The Margin of Error in the Wassermann Reaction. I. Simons, R. L. Jones, W. B. Goddard.

Twenty-five Cases of Extragenital Syphilitic Infection. H. H. Hazen.

The Naming of Syphilis. D. W. Montgomery.

Journal of the American Medical Association, Chicago.

LXVII. July 29.

The Care of the Children's Teeth: The Most Neglected Feature of Pediatric Medicine. T. C. McCleave.

The Prognosis of Infantile Paralysis. W. G. Stern.

A Bacteriologic Study of the Causes of Some Stillbirths: Preliminary Report. J. B. De Lee.

August 5.

Focal Infection in Relation to Certain Dermatoses. M. L. Ravitch.

The Diet of Children after Infancy. J. H. M. Knox.

August 19.

The Influence of Diet on the Development and Health of the Teeth. J. I. Durand.

A Study of an Epidemic of Fourteen Cases of Trichonosis with Cures by Serum Therapy. B. F. Salzer.

A Note on the Serum Treatment of Poliomyelitis. Simon Flexner.
Medical Education in the United States, Annual Presentation of Educational Data for 1916 by the Council on Medical Education.

August 26.

Poliomyelitis, With Some Observations on Thirty Cases. A. L. Hoyne and F. P. Cepelka.
Municipal Control of Infantile Paralysis. A. Sophian.
Fourteenth Annual Summary of Fourth of July Injuries.

Journal of Laboratory and Clinical Medicine, St. Louis.

I. *August.*

Immunity in Syphilis. Hans Zinsser.
A Review of the Complement Fixation Test in Tuberculosis. H. R. Miller.
Focal Infection. J. W. Shuman.
Stupid Words and Statements Commonly Appearing upon Laboratory Reports. B. G. R. Williams and E. N. Williams.

Modern Hospital, St. Louis.

VII. August.

Systematic Health Service for Employees. Lee K. Frankel, Ph. D.
Present Scope of Welfare Work in the Iron and Steel Industry. Thomas Darlington, C. E., M. D.
Provisions for Medical Care Under Health Insurance. Alexander Lambert, M. D.
Illinois Central Railroad Opens New Hospital. Richard E. Schmidt.
Industrial Welfare Work a Factor in Modern Management. J. M. Eaton.
Youngstown Sheet and Tube Company's Hospital. R. J. Kaylor.
Cloak, Suit, Skirt, Dress, and Waist Industries. George M. Price, M. D.
Welfare and Efficiency Achieved at the Same Time. William H. Walsh.
Looking Beyond the Door of Welfare Service in the Department Store. Anne Kendrick Walker.
Welfare Work in a Bookbinding Establishment.

New York Medical Journal.

August 12.

Congenital Syphilis. F. Wise.
Health Insurance from the Viewpoints of the Physician. A. C. Burnham.
Gonorrhea and Its Complications. A. Hyman.

CIV. August 19.

The Control of Epidemics. J. Manning.

August 26.

Typhoid Fever. I. L. Nascher.

New York State Journal of Medicine.

16. August.

Epidemic Poliomyelitis. F. F. Froeczak.
A Study of the Fatality of Chickenpox, Mumps, and German Measles. L. R. Williams.

Public Health Journal, Toronto.

VII. August.

Tuberculosis in Relation to Feeble Mindedness. P. H. Bryce.
Poliomyelitis. W. H. Frost.
The Care of School Children under School Age. D. Forsyth.
The Necessity for Food Inspection. G. R. Mines.

Southern Medical Journal, Birmingham.

IX. August.

Symposium on Tuberculosis.
District Tuberculosis Nursing Plan in Florida. J. Y. Porter.
The Real Value of Climate. C. M. Hendricks.
Some Problems in Public Health Education. J. D. Davis.
Notes from Field Work; Malarial Survey of Impounded Water. H. R. Carter.
Report of Typhoid Fever in Birmingham with Recommendations for Its Eradication. L. L. Lumsden.
Education of the Railway in First Aid Work. A. C. Scott.
Symposium on First Aid.
The Medical Trust. I. W. Cooper.

Texas State Journal of Medicine, Fort Worth.

XII. August.

Pellagra. K. H. Beall.
Some Views on Oxidase Activity in Pellagra. G. D. Fairbanks.
Epidemiology of Pellagra. E. M. Parrish.
Typhus Fever: Prevention and Control. C. C. Pierce.
Epidemic Typhus Fever in South Texas. H. L. McNeil.

United States Public Health Reports.

31. August 4.

Syphilis: Some of Its Public Health Aspects. L. L. Williams.

August 11.

Sanitation of Railway Cars. T. R. Crowder.

August 18.

Poliomyelitis in New York City.
Diagnosis of Plague in Rats. C. L. Williams.

August 25.

Mental Examinations of School Children. Taliaferro Clark.

BRITISH EMPIRE.

British Medical Journal, London.

II. July 1.

Life History of Ascaris Lumbricoides. F. H. Stewart.
Disinfection of Nasopharynx of Meningococcus Carriers with Air Saturated with Chloramine. M. H. Gordan.

July 8.

Tuberculins and Vaccines. E. H. Coleman.

July 22.

Industrial Diseases.

Journal of State Medicine, London.

XXIV. August.

Housing Operations and Their Results in Liverpool. E. W. Hope.
How the Poor in Edinburgh are Housed. W. S. Brown.
Dirty Milk.
The Conservation of Scottish Watershed Areas. J. L. Jack.

Lancet, London.

II. July 8.

Use of Tuberculin in General Practice. J. L. Bobie.
Use of Ammonia in Chlorination of Water. J. Race.

June.

Housing and Town Planning.
Coöperation between Health Authorities and Medical Practitioners. R. S. Agrawal.
Town Planning: Its Development and Utility. J. W. Cockrill.

Medical Officer, London.

XVI. July 15.

Notes on the Interpretation of the Results of Water Analysis. J. C. Thresh and J. F. Beale.

Public Health, London.

XXIX. August.

The Prevention and Treatment of Venereal Disease.
Phthisis in the Potteries. J. Magill and J. B. McDougal. (With a Note by Sir Thomas Oliver.)
Smells or Effluvia considered from the Chemical, Physical, and Physiological Points of View. M. Young.
The Bacteriological Examination of Fresh Milk. John Ritchie.